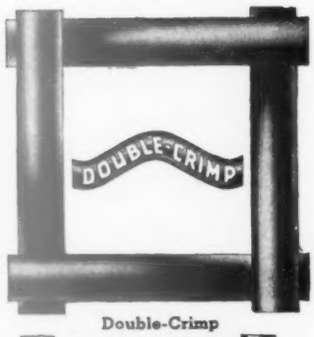
COPYRIGHT ... POSIL.

PIT AND QUARRY

NOVEMBER, 1944

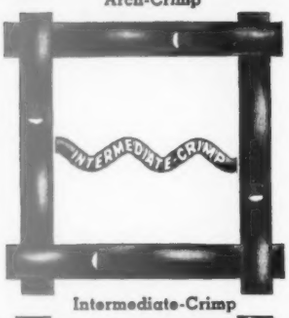
NOV 27 1944

FOR 27 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

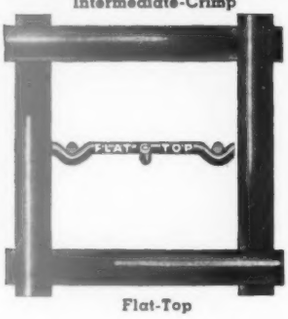


Double-Crimp

Arch-Crimp



Intermediate-Crimp



Flat-Top

"The Perfect"

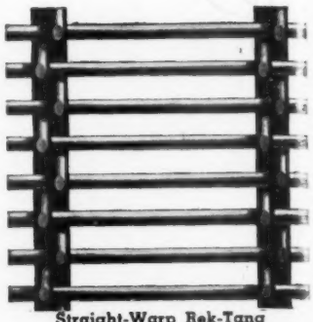
Wire Cloths and Screens

of

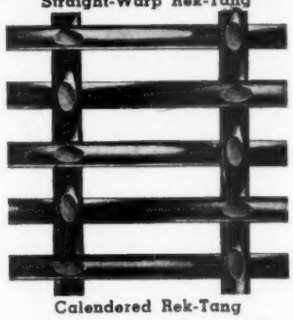
SUPER-LOY
STEEL
GALVANIZED STEEL
STAINLESS STEEL
NICKEL-CHROME STEEL
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

•

Any Special Metal for Any Service

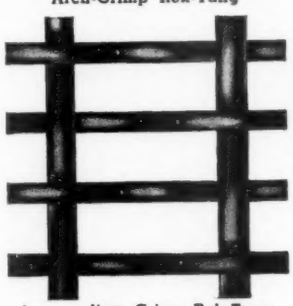


Straight-Warp Rek-Tang



Calendered Rek-Tang

Arch-Crimp Rek-Tang



Intermediate-Crimp Rek-Tang

"Perfect" WEAVES

ARCH-CRIMP
Coiled
DOUBLE-CRIMP
Double-Fill
Dutch
FLAT-TOP
INTERMEDIATE-CRIMP
REK-TANG
Selvage-Edge
STRAIGHT-WARP
Stranded
STA-TRU
Triple-Warp
Twilled
Twisted-Fill
Twisted-Warp

"Perfect" PROCESSING

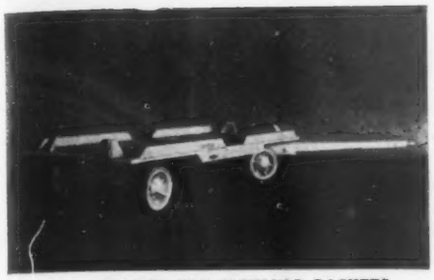
Arc-Welding
Bending
Binding
Brazing
CALENDERING
Coiling
Crimping
Cutting
Dipping
Dishing
Finishing
Flanging
Flattening
Forming
Framing
Galvanizing
Jointing
Knuckling
Painting
Rolling
Selvaging
Shaping
Shearing
Slitting
Soldering
Spot-Welding
Squaring
Stitching
Tack Welding
Trimming

"Perfect" PRODUCTS

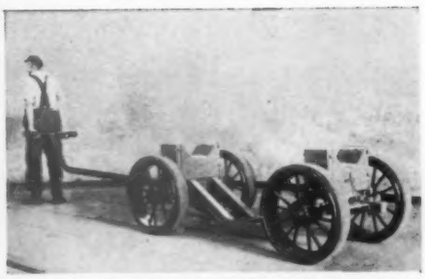
Baskets
Circles
Coils
Cones
Cylinders
Discs
Forms
Leaves
Lengths
Panels
Pieces
Ribbons
Rings
Rolls
Sections
Segments
Strips
Templates

Illustrations show items listed in capitals. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

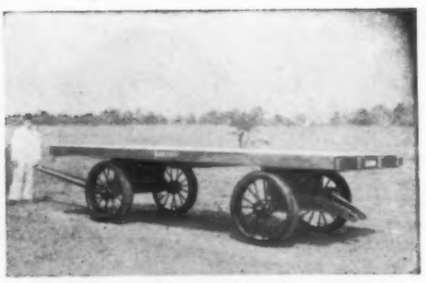
Sta-Tru



1. TRAILER FOR PICKLING BASKETS



2. REVERSIBLE TRAILER FOR CRANK SHAFT



3. 10-TON PLATFORM TRAILER

4. 15-TON FRAME CAR

5. 50-TON CAR

6. 15-TON PLATFORM CAR

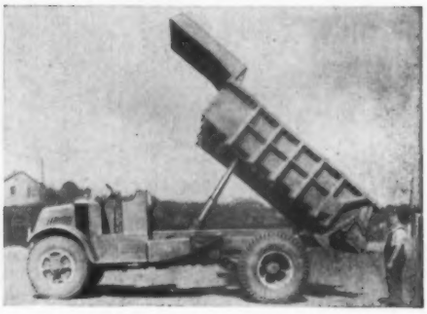
7. TIER-LIFT STORAGE BATTERY POWER TRUCK

8. 150 CU. FT. CHARGING CAR

9. UNDERGROUND MINE CAR

10. BODIES FOR SIDE DUMP ORE TRUCKS

11. SEMI-TRAILER (TRACKLESS MINE CAR)



12. 9-YD. QUARRY BODY AND HOIST

ENGINEERED TRANSPORTATION IS OUR *Business*

Each of these trailers, cars and trucks is serving the varied transportation operations of one war industry—a large corporation vital to war production. All of them were engineered and built by EASTON. Some are standard models, while others were designed to meet specific problems. Still, these views show but a few of the hundreds of different types of EASTON handling equipment. Here is a wealth of "know-how" that makes EASTON your materials-handling headquarters. For information on how your handling problems might be solved, write to: Engineering Counsel, Easton Car & Construction Company, Easton, Pennsylvania.

EASTON

INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

A—1005

PIT AND QUARRY, November, 1944, Vol. 37, No. 5. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

What makes this Upson-Walton Cargo Hoister a Better Cargo Hoister?

UPSON-WALTON have manufactured cargo hoisters for more than a quarter of a century. They were good cargo hoisters—but they could never compare with the cargo hoisters we have just perfected, after over a year of the most intensive engineering research and development.

Today's Upson-Walton cargo hoister is a *better* cargo hoister —*better* in many ways. You can depend on it to give *better* service under actual operating conditions because:

TIMKEN ROLLER BEARINGS ARE SEALED IN—operators cannot tamper with them and throw the bearing out of adjustment.

REINFORCING RIBS ARE INSIDE, PROTECTED—they can't be knocked off on the job, thereby weakening the block. Smooth surface of block prevents snagging or catching on obstacles.

SPECIAL ANALYSIS STEEL SHELL—gives greater ultimate strength and toughness. The quality of the steel used makes it possible to get a better casting surface; casting is free from weakening pits and inclusions.

ALL SHELLS ARE HEAT TREATED—to relieve internal stresses. Strength is uniform throughout; there are no weaknesses, hence the block itself is stronger.

ALL CONNECTIONS ARE DROP FORGED FINE GRAIN STEEL—this results in a greater toughness and strength. Every shackle and swivel eye is as strong as the block itself. Here again—no weak parts to weaken performance.

EXTRA HEAVY STEEL SHEAVES—recessed in the shell plate so that rope runs freely always.

AS WE GO TO PRESS, DELIVERIES ARE GOOD

U-W

ESTABLISHED 1871

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

NEW YORK • PITTSBURGH • CLEVELAND • BUFFALO • CHICAGO

Lorain 82

DOES AN AVERAGE 4 YEARS' WORK IN 2

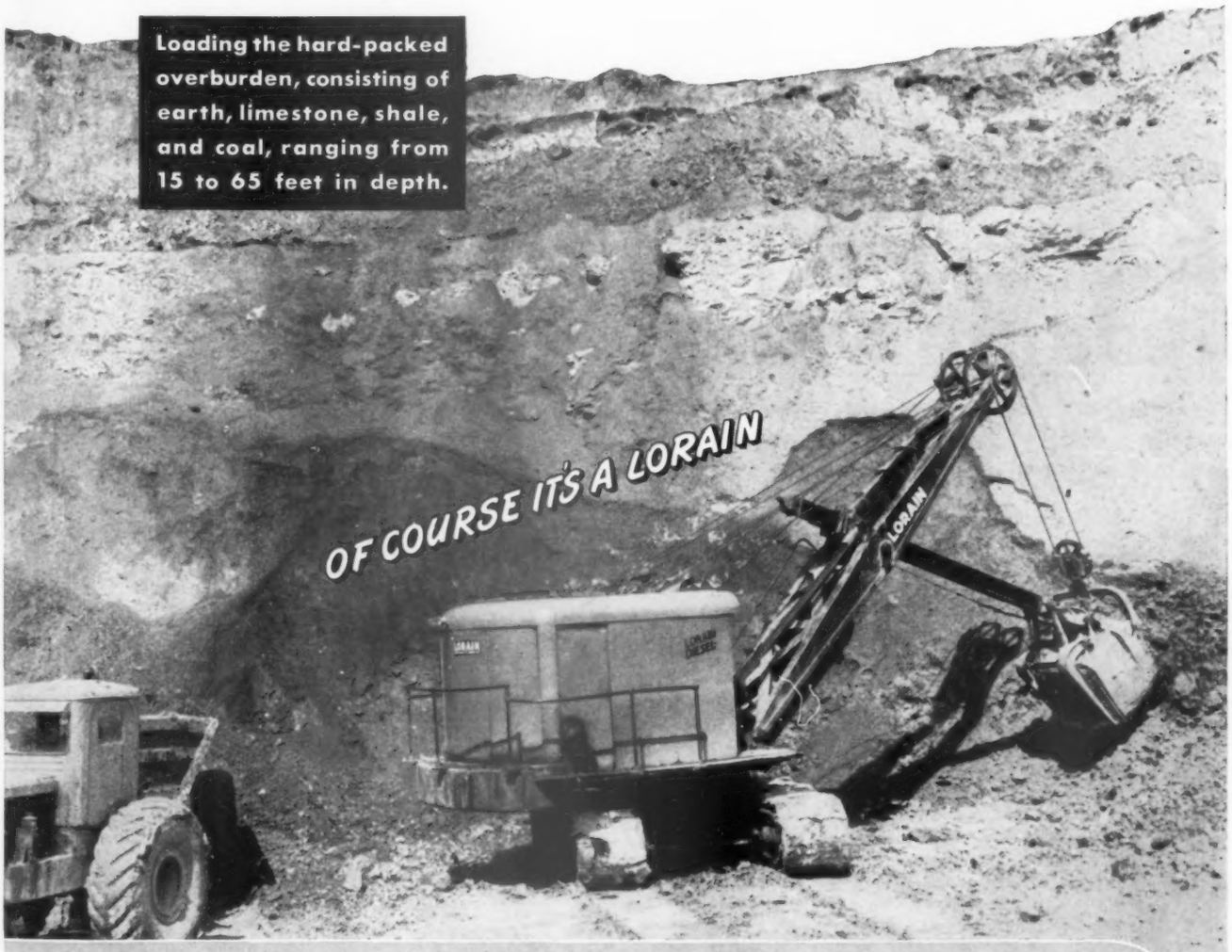
for Laclede Christy Clay Products

LATEST records on this Lorain 82, 2 cu. yd. shovel, show that since April of 1942 it has been in almost continuous operation for more than 8,000 hours, giving its owners better than 4 years' average service in 2.

Despite the rough going, this job demanded a shovel with ample payload capacity to keep the fleet of hauling units steadily on the move. As usual, the 2 yd. Lorain 82 came through ace high with plenty of fast-'n furious digging power, delivered through a shock absorbing, hydraulic coupling that means big yardage, low maintenance cost.

When you begin shaping up your plans for post-war replacements of obsolete or wornout equipment, you'll be profit-wise to investigate the greater power, strength, and low cost operating qualities built into all Lorains. Contact your Lorain distributor now He can be a big help to you in planning your peacetime equipment setup.

THEW SHOVEL COMPANY • LORAIN, OHIO


Loading the hard-packed overburden, consisting of earth, limestone, shale, and coal, ranging from 15 to 65 feet in depth.
OF COURSE IT'S A LORAIN
LORAIN

Reg. Trade Mark

thew-Lorain SHOVELS

CRANES • DRAGLINES • MOTO-CRANES

At the control panel, this project engineer is studying the results of a test on one of the many Wellman dynamometers.

Solving your problems of RUBBING SURFACES

FRICTION is developed when two surfaces are rubbed together. Friction lights a match . . . and it's friction that operates your clutches and brakes. In the great S. K. Wellman laboratories we are engaged in continuous study of powder metallurgy, to improve friction qualities of Velvetouch *all-metal* clutch facings and brake linings . . . to bring you dependable friction materials *engineered to your exact specifications.*

Specify Velvetouch replacement clutch facings and brake linings for your tractors, graders, scrapers, shovels and other earthmoving equipment.

THE S. K. WELLMAN COMPANY
1374 EAST 51st STREET • CLEVELAND 3, OHIO

Interesting Facts About FRICTION

If two rubbing surfaces are separated by a film of oil, the friction is almost independent of the nature of the surfaces.

As shown in the illustration, a 10 lb. block sliding on a non-lubricated surface, requiring 2 lbs. of force, has a .2 coefficient of friction. When the surface is lubricated, however, the force required is only 1 lb. and the coefficient of friction drops correspondingly to .1 As lubrication decreases, the coefficient of friction becomes more dependent upon the material of the surfaces.

For Brake and Clutch . . . Use Velvetouch

Velvetouch is *all metal*— a combination of powdered metals, compressed, sintered and welded to a solid steel backing plate.

"MODERN EQUIPMENT serviced with Gulf Products makes short work of overburden"

says this strip mining Contractor*

"Gulf Quality Lubricants and Fuels help keep every unit on the job— and operating efficiently"

Our formula for fast stripping is modern equipment plus Gulf quality lubricants and fuels," says this Contractor.* "Proper lubrication and top-notch fuel performance help us avoid excessive wear and mechanical troubles, and contribute to smooth dependable operation of every unit."

Leading contractors on all types of earth-moving projects depend on Gulf lubricants and fuels to help them do a speedier, more profitable job. For they know that the use of quality petroleum products is one of the surest guarantees of efficient job operation and best insurance against breakdowns and mechanical troubles.

Call in a Gulf Service Engineer today and ask him to check over your equipment. He will recommend lubricants and fuels best suited to your particular equipment and operating conditions.

The services of a Gulf Engineer—and the Gulf line of quality products—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office.

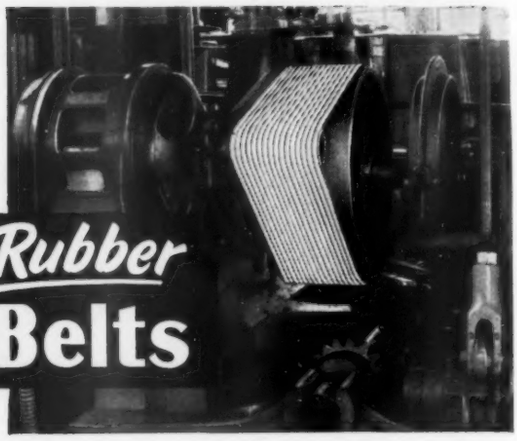
*Keeley Construction Company, Clarksburg, West Virginia, has several large coal stripping contracts in Harrison County, near Clarksburg. Along with most other leading strip mining contractors in this high-tonnage district, this contractor is a hundred per cent user of Gulf quality lubricants and fuels.

GULF

GULF OIL CORPORATION • GULF REFINING COMPANY

GULF BUILDING, PITTSBURGH 30, PA.

ONE EXAMPLE: On this drive, operating conditions gave the belts a severe soaking with oil. Gates special synthetic V-belts were installed. They are giving more than twice the service life of any belts previously used.



In Hundreds of Plants—

GATES Synthetic Rubber V-Belts

Are OUTWEARING Any NATURAL RUBBER V-BELTS Ever Used!

Now that every V-Drive in your plant depends upon belts made of synthetic rubber it pays to know that Gates Synthetic Rubber V-belts have been in nation-wide use for *more than 6 years*—and through all that time they have been giving service actually superior to belts of *natural rubber!*

There is naturally a reason for this marked superiority of Gates synthetic rubber belts—and here it is:

Gates began making large quantities of belts entirely of synthetic rubber long before synthetic rubber came to be thought of as merely a *substitute* for natural rubber. Gates used synthetic rubber not as a substitute but as an *improvement*— in fact, Gates chose a very *special* synthetic for the one reason that it is, in many important respects, *greatly superior* to natural rubber.

*There are, of course, many kinds of synthetic rubber. Gates uses each kind where it best meets some particular service need.

For Example:—One special synthetic rubber which Gates uses extensively in making V-belts has the ability to withstand oil and heat much better than natural rubber can. Where oil and heat conditions are especially severe, Gates special synthetic V-belts are giving 3 times to 4 times the service life of any natural rubber V-belts ever used.

This is the record not of a few belts over a limited period but of thousands upon thousands of Gates synthetic rubber V-belts installed in hundreds of plants and factories during the past 6 years.

Gates long headstart and outstanding success in making V-belts of synthetic rubber is of greater importance to you now than ever before because the entire operation of your plant today depends so largely on synthetic rubber V-belts.

You will gain a distinct advantage in V-belt service and operating efficiency by picking up your telephone directory and calling the Gates Rubber Engineer. (Just look under the heading "Gates Rubber.") He will bring right into your plant the full benefits of Gates' knowledge and experience —without the slightest obligation.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

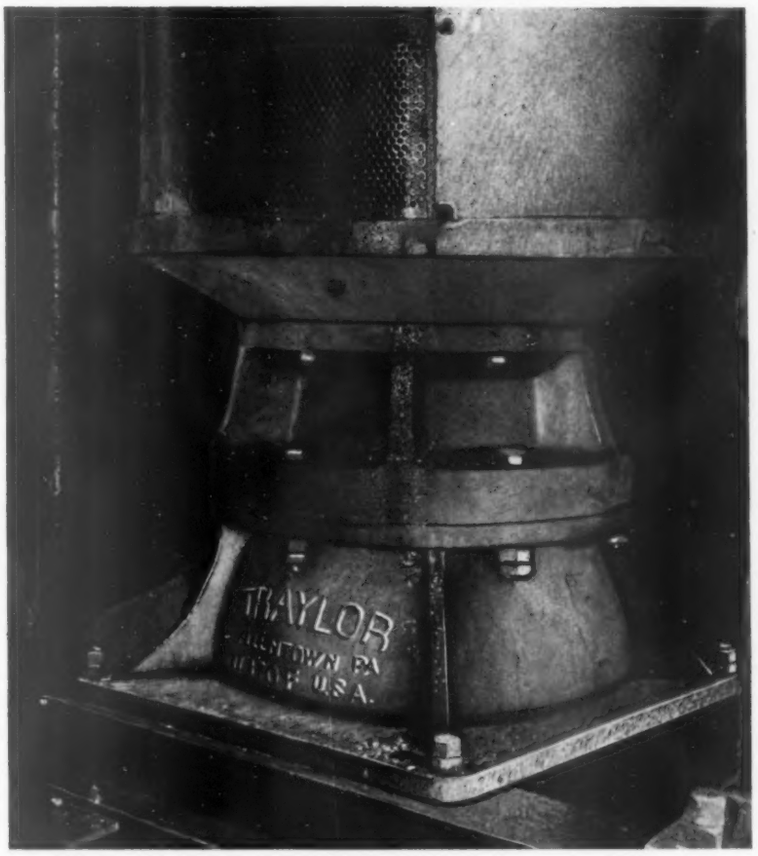
4411

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C & S National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DETROIT, MICH. 8663 Grand River Avenue
PORTLAND, ORE. 333 N. W. 5th Avenue
DALLAS, TEXAS 2213 Griffin Street
SAN FRANCISCO, CAL. 1090 Bryant Street

DO YOU NEED A REDUCTION CRUSHER?

INVESTIGATE THE "Type TY"



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

SPECIFICATIONS

Upper Shell—Cast Steel, with Spider integral

Bottom Shell—Cast Steel, with all-around discharge

Main Shaft—Extra short, forged steel

Head Mantle and Concaves—Manganese steel Bell Heads and Curved Concaves

Shaft Suspension—Ball-and-Socket type with protection springs

Gearing—Cast Steel, cut teeth

Lubrication—Automatic

Dust Protection—Postive

Sizes—Four, ranging from 20 TPH to 1/2"

WRITE FOR BULLETIN 3112

TRAYLOR

ENGINEERING & MANUFACTURING CO.

MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY
3416 Empire State Bldg.

CHICAGO
2051 One La Salle St. Bldg.

SALT LAKE CITY
101 West Second South St.

LOS ANGELES
919 Chester Williams Bldg.

SPOKANE
S. 2707 Rhyolite Rd.

B. C. EQUIPMENT CO., LTD.
551 Howe St., Vancouver, B. C.

AGENCIES

R. S. Armstrong & Bro. Co.
676 Marietta St., N. W.
Atlanta, Ga.

Balzer Machinery Co.
2136 S. E. 8th Ave.
Portland, Ore.

Pat Flanagan
Box 445
Tampa, Fla.

Indiana Equipment Co., Inc.
327 W. Market St.
Indianapolis, Ind.

W. H. Milroy
129 Church St.
New Haven, Conn.

Roy C. Whayne Supply Co.
Cor. 8th & Main
Louisville, Ky.

It pays to be a Bemis Multiwall paper bag Customer

EVEN though direct government purchases have taken a considerable part of our multiwall paper bag production this year, Bemis customers have not suffered . . . they have been supplied on the basis of past purchases, even in the face of the labor shortage and no increase in facilities.

Naturally, the demand for Multiwalls has been greater than the supply. Much as we regret inability to fill all orders, we have felt a responsibility to take care of our regular customers first. Fortunately, we've been able to do that—and right on schedule. If it's humanly possible, we'll keep on maintaining this service.

War or peace, we want our customers to feel that it pays to be Bemis customers.

NORTH
WEST EAST
SOUTH

A major reason we've been able to supply our Multiwall customers is the size and flexibility of our production facilities.

Bemis Multiwall Plants at

PEORIA, ILL.
EAST PEPPERELL, MASS.
MOBILE, ALA.
SAN FRANCISCO, CALIF.
WILMINGTON, CALIF.
ST. HELENS, ORE.

These plants not only give us large production, but also quick accessibility to all parts of the country.

BEMIS BRO. BAG CO. Baltimore • Boston • Brooklyn Buffalo • Charlotte • Chicago Denver • Detroit • Houston • Indianapolis • Kansas City • Los Angeles • Louisville Memphis • Minneapolis • New Orleans • New York City • Norfolk • Oklahoma City • Omaha St. Louis • Salina • Salt Lake City • Seattle • Wichita

NOW TOUGHER THAN EVER

Armored with RAYOTWIST CORD for still greater strength!

HEAVY-DUTY FEATURES of the Goodyear HARD ROCK LUG TIRE

1 Massive lug-bar tread

2 Extra-thick undertread

3 Tread-armored sidewalls

4 Super-strong Rayotwist cord carcass

LONG the sturdiest rock tire built, Goodyear's great Hard Rock Lug tire is tougher than ever today. That's because it is now built with Rayotwist cord — Goodyear's patented rayon cord — *the strongest cord ever used in a work tire.* Now, it's doubly armored for more ton-miles' service over the hardest going.

Years of experience have already proved that the massive, wide-based lug bar tread is the surest-footed, most bruise-proof for rock work. And note how those heavy lugs extend deep down over the sidewalls — additional armor against cutting and snagging.

Goodyear design makes the Hard Rock Lug tread one that is universal, two-way, with no rights, with no lefts. That means you can count on the same powerful grip in reverse that you get forward. The straight, wide, V-shaped grooves are open at the ends and at the right angle to force out dirt and stones as the wheel revolves.

Wherever you need tough tires you will find the new Rayotwist-armored Goodyear to be the sturdiest, longest-wearing tire built from materials available today, including a compulsory amount of synthetic rubber. Now as always, it's first-choice for hard jobs.

BUY WAR BONDS — BUY FOR KEEPS

THERE'S A GOODYEAR FOR EVERY JOB

For traction in soft going specify
Goodyear Sure-Grip

For drawn dirt-movers specify
Goodyear All-Weather Earth-Mover

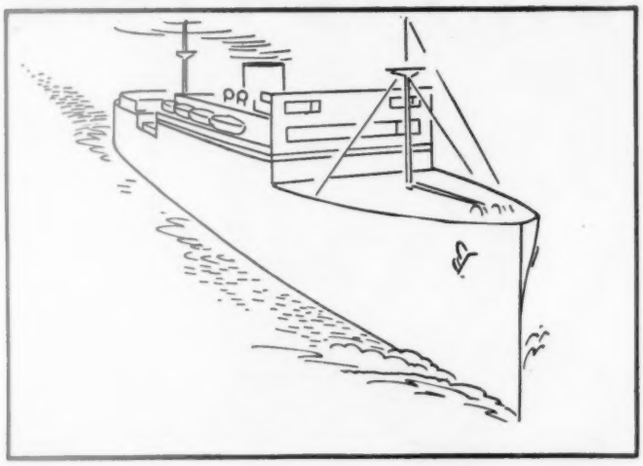
Rayotwist, Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

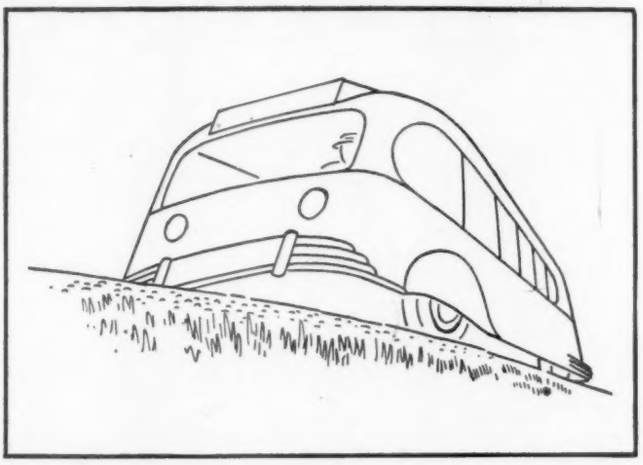
GOODYEAR

THE GREATEST NAME IN RUBBER

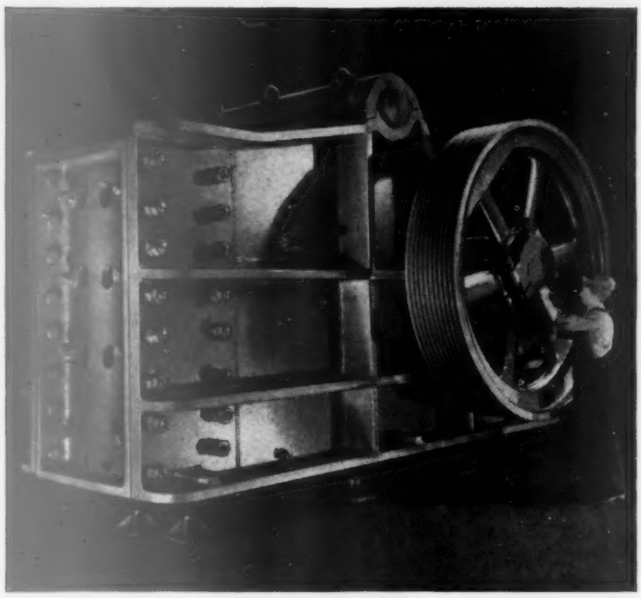
MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Carriers are Different





Crushers are Different



1 A-C JAW CRUSHERS are usually applied to primary crushing of tough, blocky materials. In the smaller sizes, they are sometimes used as single-stage machines. Have large receiving openings for blocky feed. Are available with non-choking or straight jaw plates. Five types: "All-Steel", Superior, Type "B" Blake, A-C Fine Reduction, and Dodge. Sizes from 4" x 6" to 84" x 66". Bulletin B6034.

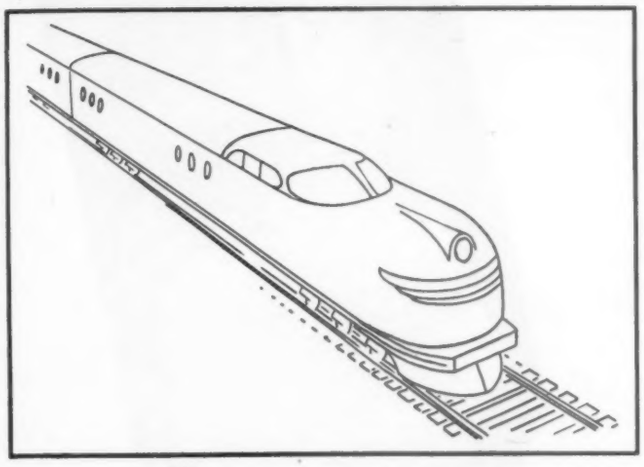
2 A-C GYRATORY CRUSHERS are used for high-capacity primary crushing or to follow primary crushers of jaw or gyratory type. Have greater feed area and considerably greater capacity than jaw crushers. Are low in operating and maintenance cost. Three types: Superior-McCully (Bulletin B6004); Type "R" (Bulletin B6006); and Type "Fine-R". Sizes from 2" to 60" receiving openings.

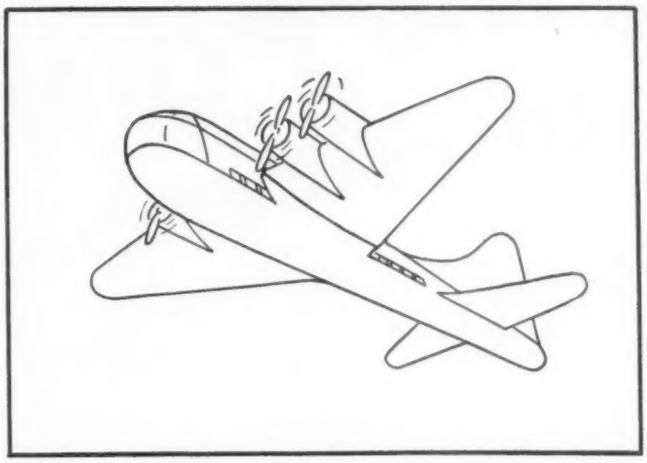
ALLIS-

Jaw, Gyratory, Hammer & Roll Crushers, Ball & Rod Mills

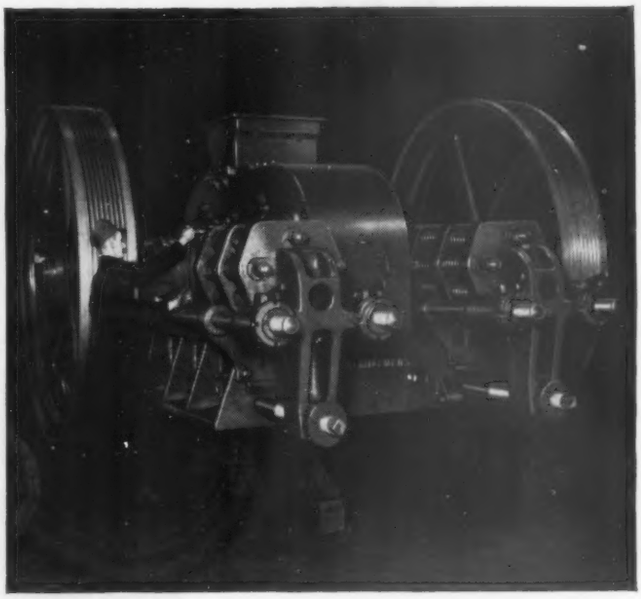
Kilns, Coolers, Roasters, Dryers

There are 4 Basic Classes of Carriers—each of which is designed to meet a *different* travelling need.





There are 4 Basic Classes of Crushers—and A-C builds all 4—helps you select the *right* type for each job.



3 **A-C ROLL CRUSHERS** handle a wide range of material including many which, due to unusual characteristics such as stickiness, etc., cannot be reduced by other types of crushers. Single roll crushers are used for primary or secondary crushing — 3 sizes from 24″ to 60″ diameter. Double roll crushers are used for secondary crushing only — 6 styles, sizes from laboratory to 78″ diameter.

4 **A-C PULVERATORS** (Hammer Mills) have broad application in crushing of non-abrasive rock such as agricultural limestone and other materials. In some applications they produce a finished product directly from man-size feed or primary crusher product in one pass. Built in 6 sizes. Bulletin B6265. ALLIS-CHALMERS, MILWAUKEE. A 1788

♪ *Tune in the Boston Symphony, Blue Network, every Sat. Eve.*

CHALMERS

Vibrating & Revolving Screens, Feeders, Conveyors, Hoists

Washers, Scrubbers, Blade Mills, Centrifugal Pumps

Tractors, Gasoline Power Units, etc.

Motors, Texrope Drives, Power Equipment

The POINT to remember

For Fine Sizing

The performance of STURTEVANT Air Separators is written in the production records of successful plants throughout the country.

For uniformity of product in the 40 to 350 mesh range, specify STURTEVANT Air Separators. They insure increases up to 300% in mill capacity, with big economies in operation—a point worth remembering.

Cement producers have installed hundreds of STURTEVANTS on approval, without rejecting a single one.

Write for Information

STURTEVANT MILL CO. BOSTON 22, MASS.

Why we put tons of chrome where it won't show

Decorative chromium is put where it *will* show. But we put tons of chromium into cylinders of Diesel and gasoline engines where it *won't* show, although you *can* see the results in greatly increased engine reliability.

We use enough chromium in *one* year to chrome-plate the bumpers of every automobile built since 1932. Yet a 16-cylinder, 1800 horsepower Diesel engine needs only 240 ounces of PORUS-KROME to multiply its cylinder life four to twenty times.

PORUS-KROME, applied by the Van der Horst process, is highly resistant to abrasion and corrosion, and "wets" with oil. Experience in thousands of engines in ships, planes, tanks, stationary and mobile power plants, buses, trucks and locomotives shows that PORUS-KROME not only multiplies cylinder and ring life, but reduces scuffing, ring feathering and risk of piston seizure.

Right now, Van der Horst is busy on cylinders in engines for the war. However, it is not too soon for you to plan to have PORUS-KROME in your own engines. When Government restrictions are relaxed, PORUS-KROME will be available to you in new engines and also in replacement liners for existing engines.

Ask for PORUS-KROME . . . and be sure of greater engine reliability.

PORUS - KROME

Good for the Life of your Engines

VAN DER HORST TRADE MARK

U. S. PATENTS 2,048,578 AND 2,314,604

VAN DER HORST CORPORATION OF AMERICA • OLEAN, NEW YORK • CLEVELAND 11, OHIO

AN AFFILIATE OF DRESSER INDUSTRIES

"MEASURED AIR" PROVIDES

- MORE POWER—LONGER LIFE
- LESS OPERATING COST
- MORE WORK DONE FASTER

with all these

Thor

CONTRACTORS' AIR TOOLS!

Thor "AIR ECONOMY" FIGURED IN YOUR POST-WAR EQUIPMENT PLANS WILL SAVE YOU TIME, CUT COSTS . . . GET TOMORROW'S JOBS STARTED FAST AND MOVING!

The maximum power, balanced stroke and ease of handling provided by exclusive Thor *"measured air"* construction is available in every one of these Thor Contractors' Air Tools to save you time and operating costs on *all* construction jobs.

THOR PAVING BREAKERS

Thor Paving Breakers, light, medium and heavy duty models, are equipped with the same "measured air" type of short-travel tubular valve as Thor Rock Drills.

The Paving Breaker valve actuates a block type piston, powering it with exactly the quantity of air required for both the forward and return strokes . . . minimizes vibration . . . makes the machine easy to handle.

THOR CLAY DIGGERS

Air that powers the stroke of Thor Clay and Trench Diggers is measured by a new short-travel cylinder "rocker" valve which provides *perfect sealing and control* of required pressure for driving the piston.

HOW Thor "MEASURED AIR" ECONOMY WORKS!

Short-travel valve action is the real secret behind Thor "measured air" economy.

The shorter the travel, the more *positive the action* of the valve in admitting to the tool only the required amount of air—in instantly sealing the inlet against excess air.

Short-travel action *reduces wear* on the valve, retains positive "measure" of air for a greatly extended period of service.

Short-travel valve action powers each stroke of the tool with the same quantity of air—providing *smooth, uniform operation.* Elimination of excess air keeps out of the channel the overload of power that staggers the stroke and causes vibration.

For particulars about *automatic rotation . . . cushioned action . . . automatic lubrication . . . exclusive retainer design,* and many other features of Thor Contractors' Air Tools, write today for Catalog No. 42-A.

THOR ROCK DRILLS

A short-travel tubular valve, heat-treated for durability and precision-ground for perfect fit, "measures" air that powers all three types of Thor Rock Drills—Sinkers, Drifters and Stopers.

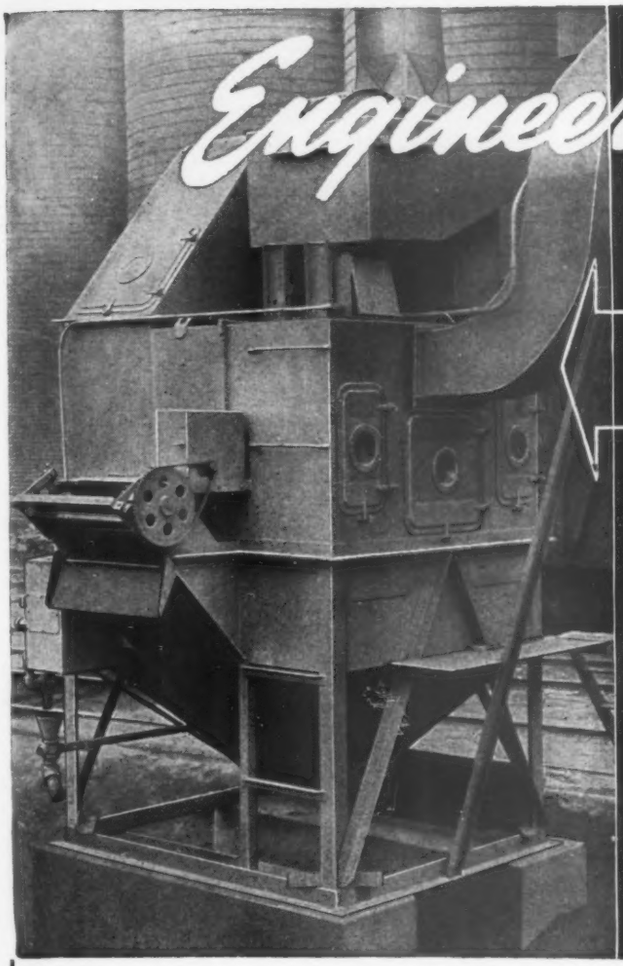
This precise control of air consumption provides steady power and smoothness in the *automatic rotation* of these drills. *Controlled air* driving the piston gives the steel on the working end maximum forward and rotative action . . . assures fast drilling speed!

Thor Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY

EXPORT DIVISION
330 W. 42ND ST., NEW YORK, N.Y., U.S.A.

THOR ROCK DRILLS	THOR DRIFTER ROCK DRILLS	THOR STOPER ROCK DRILLS	THOR PAVING BREAKERS	THOR CLAY AND TRENCH DIGGERS	THOR BACKFILL TAMPERS	THOR SUMP PUMPS
Six light, medium and heavy duty models for all rock formations.	One light, and one medium weight model, hand or power feed, for all hard rock drifting.	One medium, and one heavy duty model for sloping under all drilling conditions.	Four light, medium and heavy duty models for all demolition work.	One light, medium and heavy duty model of each for all tunnel and wall work.	One light and one heavy duty model for tamping clay and other stiff materials.	One current model, designed for all jobs under most unfavorable conditions.



Engineered TO ROCK PRODUCTS DUST CONTROL REQUIREMENTS

TYPE N ROTO-CLONE INSTALLATION AT THE FUNKHOUSER COMPANY

This Roto-Clone exhausts 7000 cfm from a drier removing a heavy concentration of fine slate dust. This dust load with the combustion gases from the drier is handled with constant exhaust volume and high dust removing efficiency assuring cleanliness and an improved product. The Funkhouser Company is a prominent supplier of colored slate surfacing materials for roofings.

The need for adequate dust control in the war effort has resulted in the development by AAF engineers of several entirely new types of dust control equipment, among which the Type N Roto-Clone is outstanding. Originally designed for the handling of hazardous magnesium dust in aircraft engine plants, this new wet dust collector has turned out to be unusually valuable to the rock products industry for the collection of certain types of rock dusts.

After being collected and wetted, the collected dust is disposed of in the form of sludge. In addition to the Type N Roto-Clone, the Type W, also a wet type precipitator, and the Type D, dry type precipitator, are in wide use throughout the industry. In fact, there is a Roto-Clone design available to meet every requirement of the rock products field. Write for descriptive bulletins.

AMERICAN AIR FILTER COMPANY, Inc.
INCORPORATED
192 Central Avenue — Louisville, Kentucky
In Canada: Darling Bros., Ltd., Montreal, P. Q.

ROTO-CLONE
FOR ROCK PRODUCT DUST CONTROL

War also needs big BELTS

While Belts of this size are being produced for use in the War Effort, it naturally takes that amount away from the quantity that normally would go to the civilian trade.

Quaker is maintaining Belt Production at peak figures. Demands of the War require thousands of feet. It looks much brighter now to that day when production can be devoted 100% to civilian requirements.

Belts, like the one illustrated, will convey thousands of tons of coal, gravel, sand, cement, crushed stone, concrete, or similar products and do it economically, for Quaker Belts are built to give long service, and they do it!

This 36" 7 Ply Conveyor Belt, made in one piece, is over sixteen hundred feet long, with a net weight of 15,409 pounds, is just one of the many large and unusual Belts that Quaker is continually producing. Years of experience in Belt making, as well as knowledge in the workings of Synthetic Rubber enables us to give you extra high quality Belts—the kind for which Quaker has long been noted.

For sixty years, Quaker has been manufacturing Quality Industrial Products . . . Belting—Hose—Packings—and Moulded Parts. Regardless of what your rubber problem may be, feel free to consult with us—

"If there is a way to get it done—Quaker will do it"

QUAKER RUBBER CORPORATION

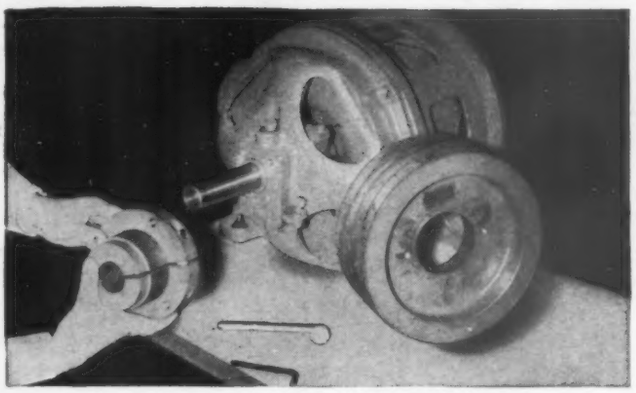
PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

Western Territory

QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21

DO YOU HAVE THESE 3 FEATURES IN YOUR PRESENT SHEAVES?

If so, they must be WORTHINGTON'S QDs



1. EASY TO GET ON

2. EASY TO GET OFF

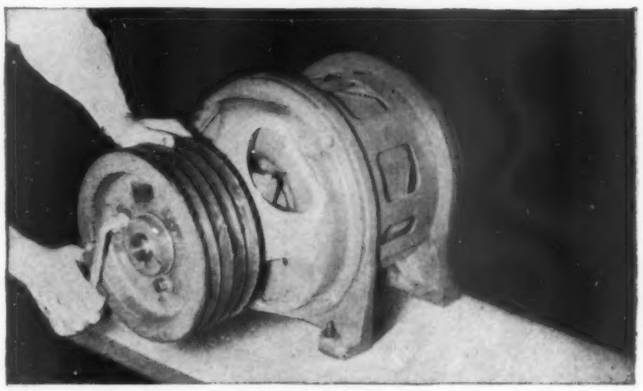
Are you losing time with old-fashioned sheaves? You may be, if you haven't got the QD's time-saving *three* features.

1. Split hub — with taper cone surface for mounting taper bored rim — makes *installation easy.*

2. Pull-up screws usable as jack bolts break Taper Friction Fit, quickly free shaft for bearing maintenance, speed changes, or *quick removal* and mounting of different diameter rims . . . without disturbing the hub. No alignment problems.

3. Bigger pull-up bolts for higher taper cone pressure insure positive clamp grip, keep sheave *always tight on the shaft.*

The sheave with these 3 features, teamed up with Worthington Goodyear Endless Cord V-Belts will give you more for your money. Stock size sheaves and belts at strategic centers from coast to coast.

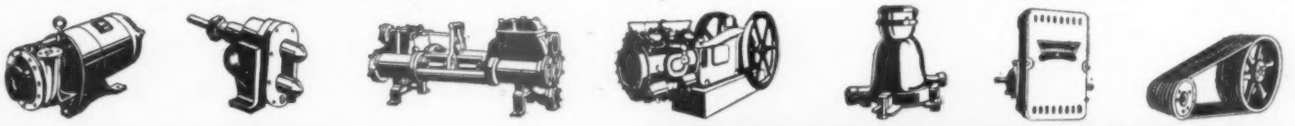


3. YET ALWAYS TIGHT ON THE SHAFT

Reading Time: 3 Minutes—To Get Accurate Belt Ratings

From the 72-page Master Manual, containing original engineering data . . . sectionalized, loose-leaf, tabbed for ready reference . . . you can select in three minutes the right Worthington V-Belt drive. You get accurate belt ratings . . . avoiding *over*-belting and *under*-belting. Send the coupon today for your free copy! Specification and installation record sheets included.

Centrifugal, Rotary, Steam & Power Pumps | Vertical & Horizontal Compressors | Liquid Meters | Variable Speed Drives | Multi-V-Drives



WORTHINGTON *BEHIND THE NAME* WORTHINGTON

Standard Products Division
Worthington Pump and Machinery Corporation
Harrison, N. J.

MV4-15

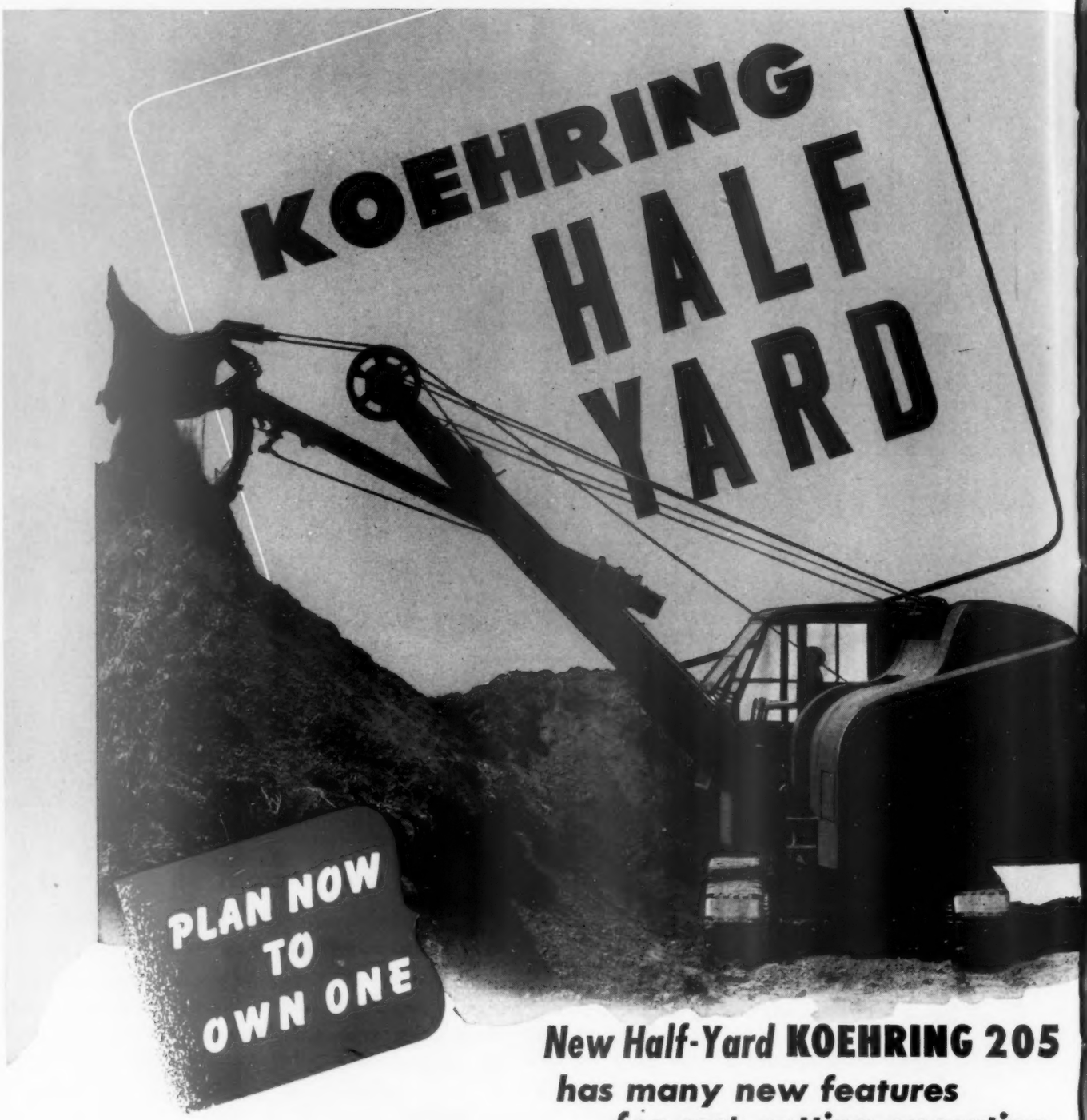
Standard Products Division
Worthington Pump and Machinery Corporation
Harrison, N. J.

Please send me a copy of the Worthington Master Manual.

Name .....

Company .....

Address .....



New Half-Yard KOEHRING 205
has many new features for cost-cutting operation

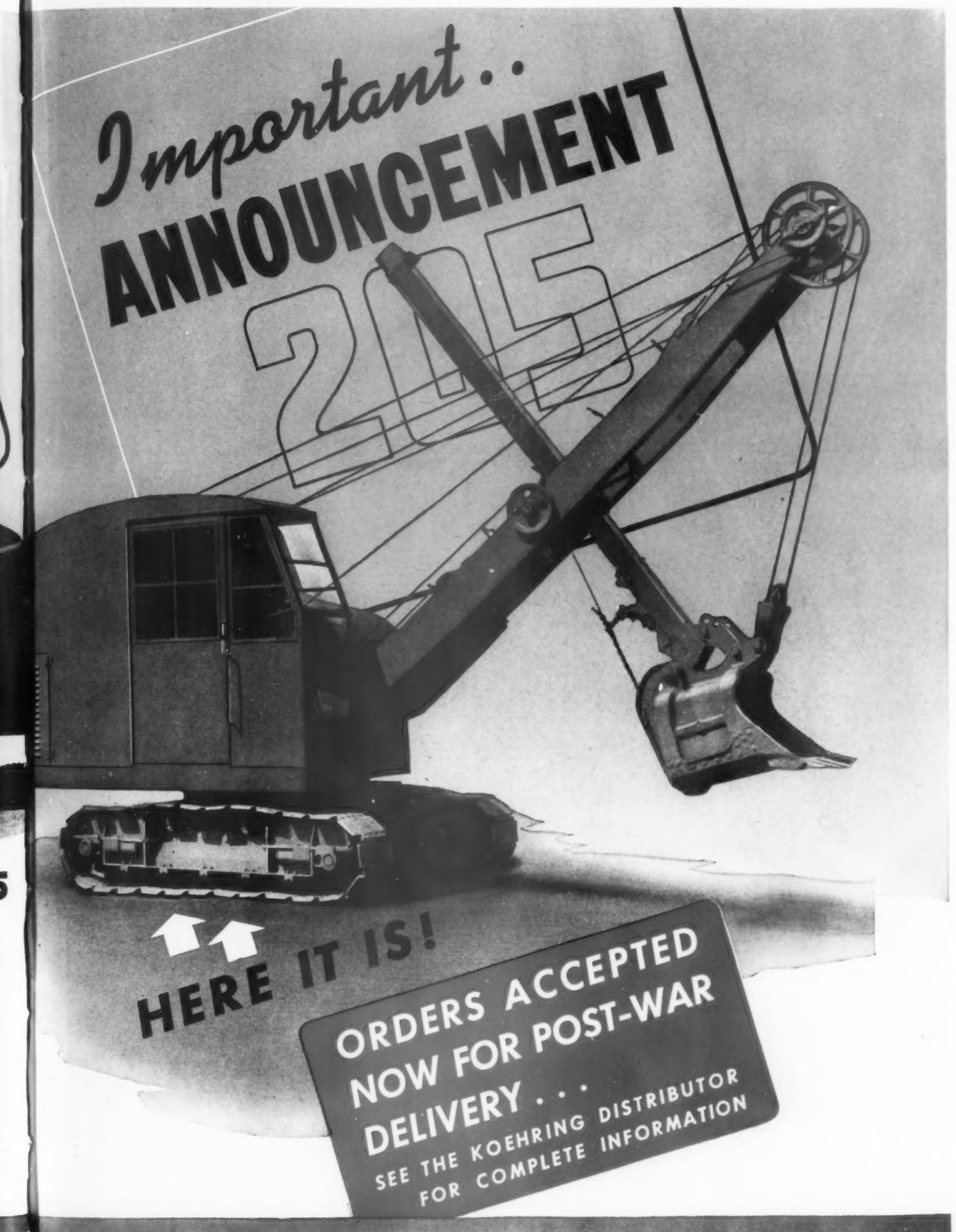
Two-In-One Shovel Boom • Trigger Fast Dipper Trip • Clear Interior Turntable • Independent Traction • Spacious Walk-Around Area • Exceptionally Accessable Machinery • Head Room in All Parts of Cab • Easily Removable Machinery Units • Two Purpose Main Machinery Support • Exceptional Steadiness • Instant Travel Reverse.

KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMEN

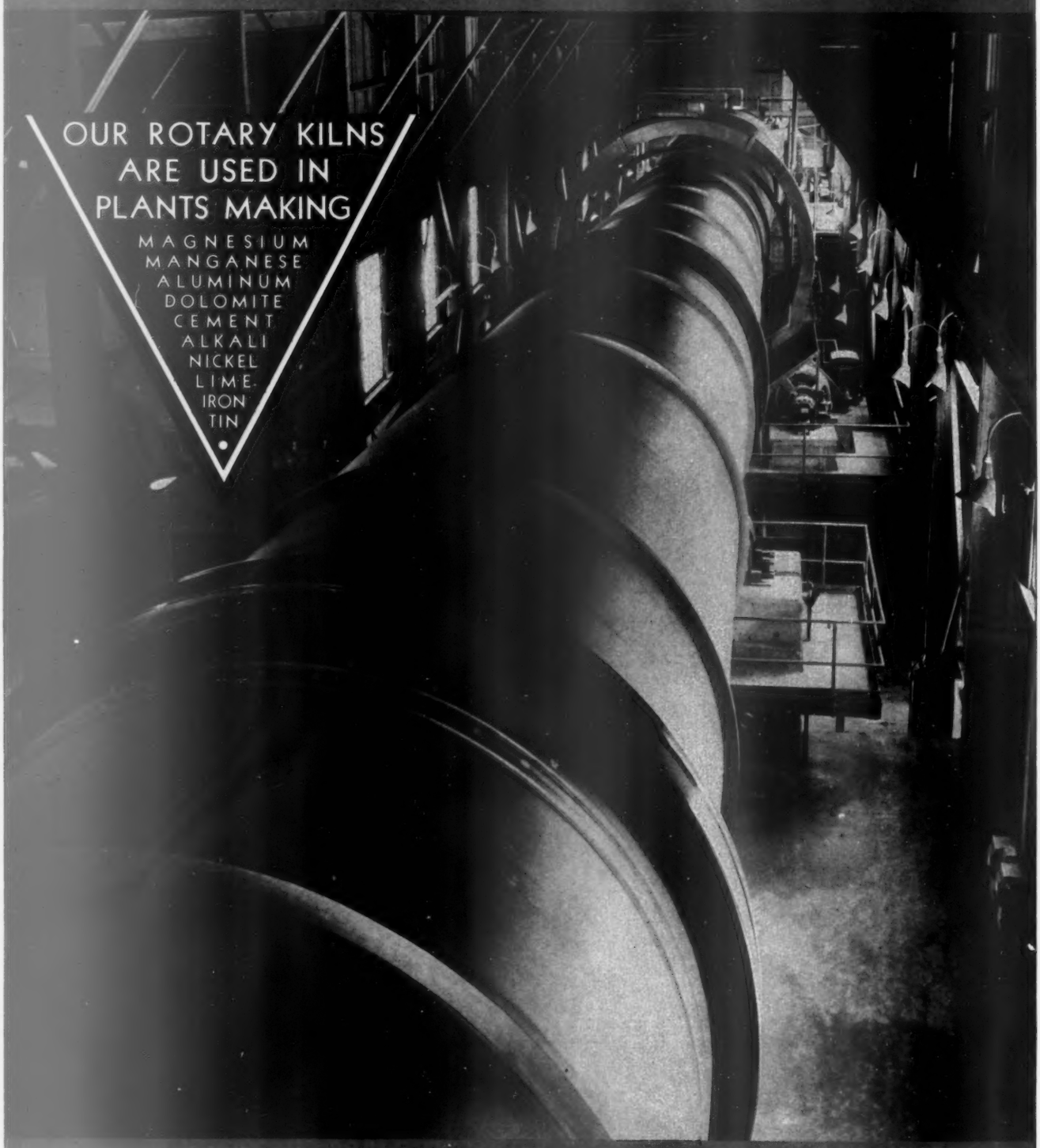
PRINT IN BIND



KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

IN BINDING

ROTARY KILNS



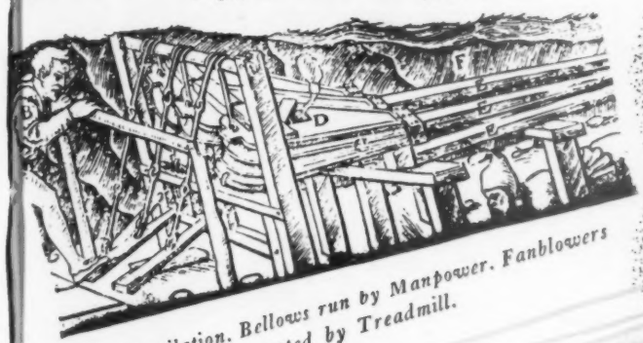
F. L. SMIDTH & CO.

60 EAST 42ND STREET — ENGINEERS AND MACHINERY MANUFACTURERS — NEW YORK, N. Y.

Power...

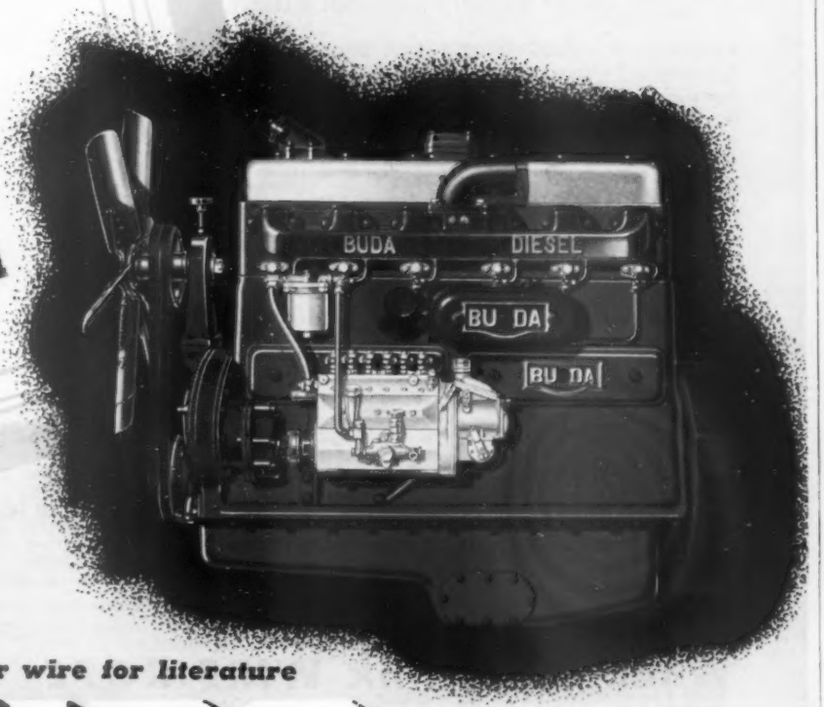
precedes progress

Bettman Archive



Mine Ventilation. Bellows run by Manpower. Fanblowers operated by Treadmill.

Lack of adequate power was the main obstacle of men with inventive minds, in the early days of our history. Today—you can have the finest most efficient, economical power ever developed, by specifying BUDA Diesels.

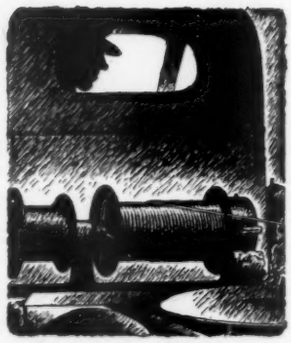


Write or wire for literature

BUDA

15426 Commercial Ave.
HARVEY (Chicago Suburb) **ILLINOIS**

Why
B-E-T-H-L-E-H-E-M F-O-R-M - S-E-T
spells
E-C-O-N-O-M-Y



One of the greatest advantages of Form-Set (Bethlehem's preformed rope) is an inherent "bendability" that makes it ideal for use with small sheaves and drums, and where sharp reverse bends are necessary. As the preforming operation greatly reduces internal stresses and strains, Form-Set rope will naturally last longer—and do the job better—where highest resistance to bending fatique is required.

Increased rope life naturally means a saving of overhead. There's a cash value, therefore, in every extra day of Form-Set's life.

And that's not the only saving. The longer your ropes remain in service, the less your machines are "down" for rigging . . . the less productive time you lose.

These are a few of the solid reasons why Form-Set means overall economy in such a wide range of industries—industries that use power shovels, cranes, derricks, overhead air and electric hoists, and many other types of machinery.

Bethlehem makes wire rope in all standard grades and constructions, any of which can be supplied with the Form-Set feature. In addition, we maintain a staff of engineers whose business it is to work closely with you on wire-rope problems.

When you think WIRE ROPE
. . . think BETHLEHEM

BETHLEHEM STEEL

the problem of SLUDGE

IT IS well known among automotive engineers that engine deposits (sludge) cause stoppage of oil circulation, sticky rings, oil pump trouble and other serious damage resulting in overhaul time and expense.

Sludge either stays in suspension in the oil and causes the lubricant to become black, or it sticks to the motor parts and does its dirty work of destruction.

LOW AND HIGH TEMPERATURE SLUDGE

There are two general types of sludge—that caused by low temperature operations and that by high.

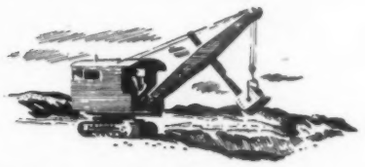
Low temperature sludge is usually a semi-solid material with the consistency of soft mud. It is composed of oil mixed with water and fine particles of carbon, metal, dirt, dust or fuel gums.

"Stop and Go" operation with prolonged idling of the motor is a common cause of low temperature sludge. A leak in the water system surrounding the cylinders may also be responsible. Low temperature sludge clogs the oil lines and screens, resulting in burned out bearings and scuffed cylinder walls.

The principal difference between high temperature sludge and low is that the former contains large amounts of resins resulting from the oxidation of the oil in the crankcase. This type of sludge is comparatively free from water and soot.

High temperature sludge produces two different kinds of deposits in the engine. The granular or "coffee ground" sludge in the crankcase or oil pan and on the surface of the pump screen is well-known to mechanics. Varnish, gummy or lacquer-like deposits that form on piston and ring faces and cylinder walls, because of high temperature oxidation of thin oil films, is another kind.

High temperature sludge is caused from prolonged high speed and engine operation, overloading the engine, clogged radiator or cooling system.



HOW TO REMEDY SLUDGE SITUATION

Low temperature sludge can be easily recognized by simply heating some of the deposit on a piece of metal over a flame. If the material foams or sputters and crackles, then water is present. To remedy this, check for internal water leaks and raise the temperature of the cooling water to 160° to 180° and keep it there by means of radiator shutters or thermostats.

To remedy high temperature sludge, inspect radiators and water jackets and see that they are clean and free of mud and scale. Drain and flush crankcase frequently, especially in heavy duty service. Oxidation of the crankcase oil can be minimized by the use of oil coolers in heavy duty truck service. Keep the crankcase oil temperature below 200° F.

To prevent either type of sludge, keep the lubricating oil clean. Filtering is not enough. Frequent draining and flushing of the crankcase is essential. Drain oil while hot. Base drain periods on a type-of-use basis, rather than time or mileage interval. Keep both air and oil filters free from dust and other foreign matter.

MACMILLAN RING-FREE OIL HELPS REDUCE SLUDGE—*One of your most effective sludge remedies is a good lubricating oil. Macmillan Ring-Free Motor Oil (for either Diesel or gasoline fuels) is so refined that it removes the carbon and sludge from the working parts of the engine. It cleanses as it lubricates. The deposits are kept in the oil in suspension and are drained off when you change oil. That's why Ring-Free is black when it's drained.*

You'll be surer of fewer motor troubles with Ring-Free Oil.

Free Folder on Sludge—Its Causes and Cures

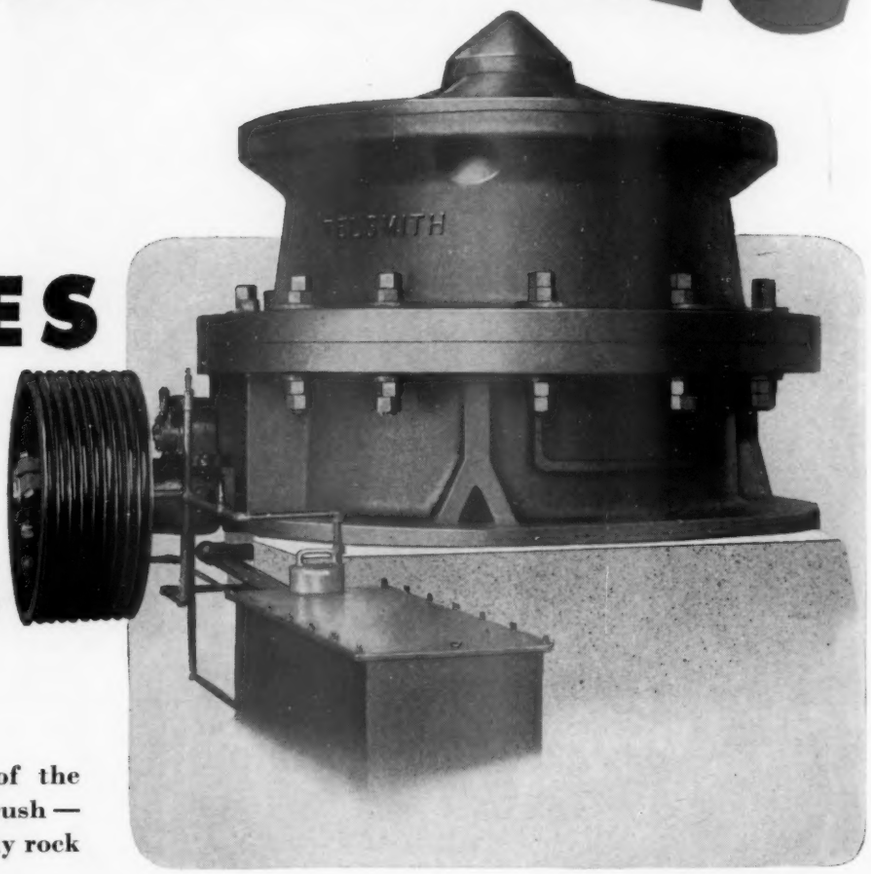
Write today for your copy • Address: Macmillan Petroleum Corp., 530 W. Sixth Street, Los Angeles 14, Calif.

MACMILLAN RING-FREE MOTOR OIL

MACMILLAN PETROLEUM CORPORATION—50 WEST 50TH STREET, NEW YORK 20 • 624 SOUTH MICHIGAN AVENUE, CHICAGO 5 • 530 WEST SIXTH STREET, LOS ANGELES 14 • COPYRIGHT 1944, MACMILLAN PETROLEUM CORPORATION

A CRUSHER SO STRONG

...that it CRUSHES FERRO ALLOYS



TELSMITH

■ Ferro-chrome, one of the ferro alloys, is tough stuff to crush — a lot harder and tougher than any rock or ore you'll ever run into.

But there's a crusher that does it — Telsmith!

It came about like this. Telsmith was called in . . . as were some other crusher manufacturers . . . and asked: "Can you build a crusher strong enough to crush ferro-chrome?"

An "impossible" problem to others—it was a challenge to Telsmith engineers. And they came through with the right answer!

Large 12 to 14-inch chunks of ferro-chrome, weighing 75 to 125 lbs. each, are fed right into these Telsmith Special Heavy Duty Crushers.

What does all this mean to you? It means that *you* get in *your* Telsmith Crusher the same inherent *extra strength* — and with it extra *dependability*. Your crusher can take *and will break* even the hardest rock or ore—because . . .

While these particular Telsmith Crushers are "specials" with extra heavy parts, they utilize the identical crushing principles involved in Telsmith Gyratory Crushers of standard design. Their great strength comes from the same combination of fundamental advantages found in all Telsmith gyratory type crushers, including:

. . . short, compact structure . . . steel frame and crown . . . rigid pillar shaft . . . and the famous Telsmith gyratory crushing action.

Telsmith thrives on tough crushing problems. Bring yours to Telsmith engineers. Get Bulletin C-15.

R-1

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y.
211 W. Wacker Drive Chicago 6, Ill.
713 Commercial Trust Bldg. Philadelphia 2, Pa.
247 Third Street Cambridge 42, Mass.
Boehck Eqpt. Co. Milwaukee 3, Wis.
Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.
Rish Equipment Co. Charleston 22, & Clarksburg, W. Va.
Rish Equipment Co. Roanoke 7 & Richmond 10, Va.
North Carolina Eqpt. Co. Raleigh and Charlotte 1, N.C.
Wilson-Weesner-Wilkinson Co. Knoxville 8, & Nashville 6, Tenn.

3 MEN AND A BELT

Three engineers — each representative of a separate technical staff — work together before a U.S. Conveyor Belt begins hauling its tonnage of materials.

If the installation is at a mine or quarry for example, these three are: the mining engineer, the conveyor equipment designer, and the rubber belting engineer.

Each contributes his part; each is necessary to the final performance of this important service in modern industry.

Because these three groups pool their experience, coordinate their skills and work as a team, materials are conveyed more efficiently today, on a volume production basis, than ever in the past.

ENGINEERED RUBBER CONVEYOR BELTS

SERVING — **THROUGH SCIENCE**

THE MINING ENGINEER plans and blueprints the property to be worked. He is responsible for all operations, and with his staff must determine where, how and in what quantities the product can be economically moved.

THE EQUIPMENT DESIGNER recommends, provides and installs the mechanical equipment needed to operate an efficient conveyor system. On his specifications depend the size and strength of conveyor belt, or belts to be used.

THE RUBBER BELTING ENGINEER combines many skills — basic knowledge of rubber compounding... thorough understanding of fabrics...engineering techniques necessary to design and fabricate the proper conveyor belt for each job.

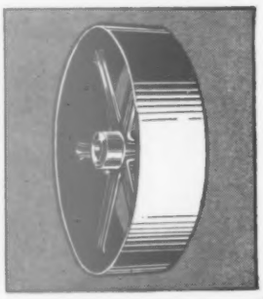
Listen to the Philharmonic-Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E.W.T. Carl Van Doren and a guest star present an interlude of historical significance.

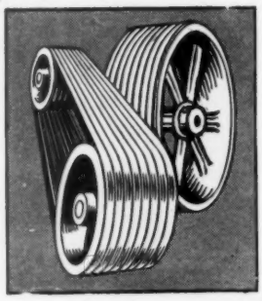
UNITED STATES RUBBER COMPANY

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y. • *In Canada:* Dominion Rubber Co., Ltd.

YOUR POST WAR PLANS

...Should Include...



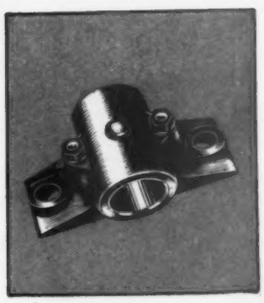


Wood's

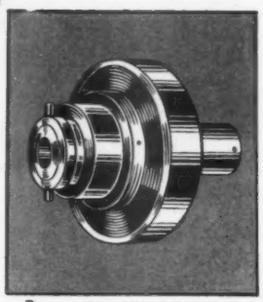
PLANNED POWER TRANSMISSION

The Wood's line of equipment for power transmission comprises bearings, collars, couplings, friction clutches, hangers, pillow blocks, pulleys and shafting for a variety of uses covering various industries, including cement mills, generators; paper mill, wood working and laundry machinery; compressors, mine fans, drill presses and for many other uses.

POWER... America's most vital War aid



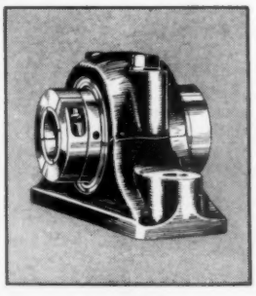
...is her source of lasting Peace



Just as power produced the weapons with which America and her Allies are bringing certain defeat to the Axis, so will power enable us to forge the tools to build up what has been destroyed . . . to recreate the means of livelihood for a war torn world and to give employment to our returning soldiers.

Of utmost importance is getting power from its primary source to the driven machinery with minimum loss. This is a job that many plants have profitably given to Wood's Planned Power Transmission Equipment. It is a job that foresighted plants in future will intrust to Wood's Equipment and be assured of top performance, without unnecessary time-losing shut-downs and with minimum maintenance.

Through wars and eras of peace during 87 years of service to American industry, Wood's Products have earned a reputation for excellence. Into this complete line of transmission equipment has gone the engineering knowledge . . . the manufacturing skill, to insure efficient, trouble-free operation. We'll gladly supply more detailed information . . . or consult one of the conveniently located Wood's distributors.

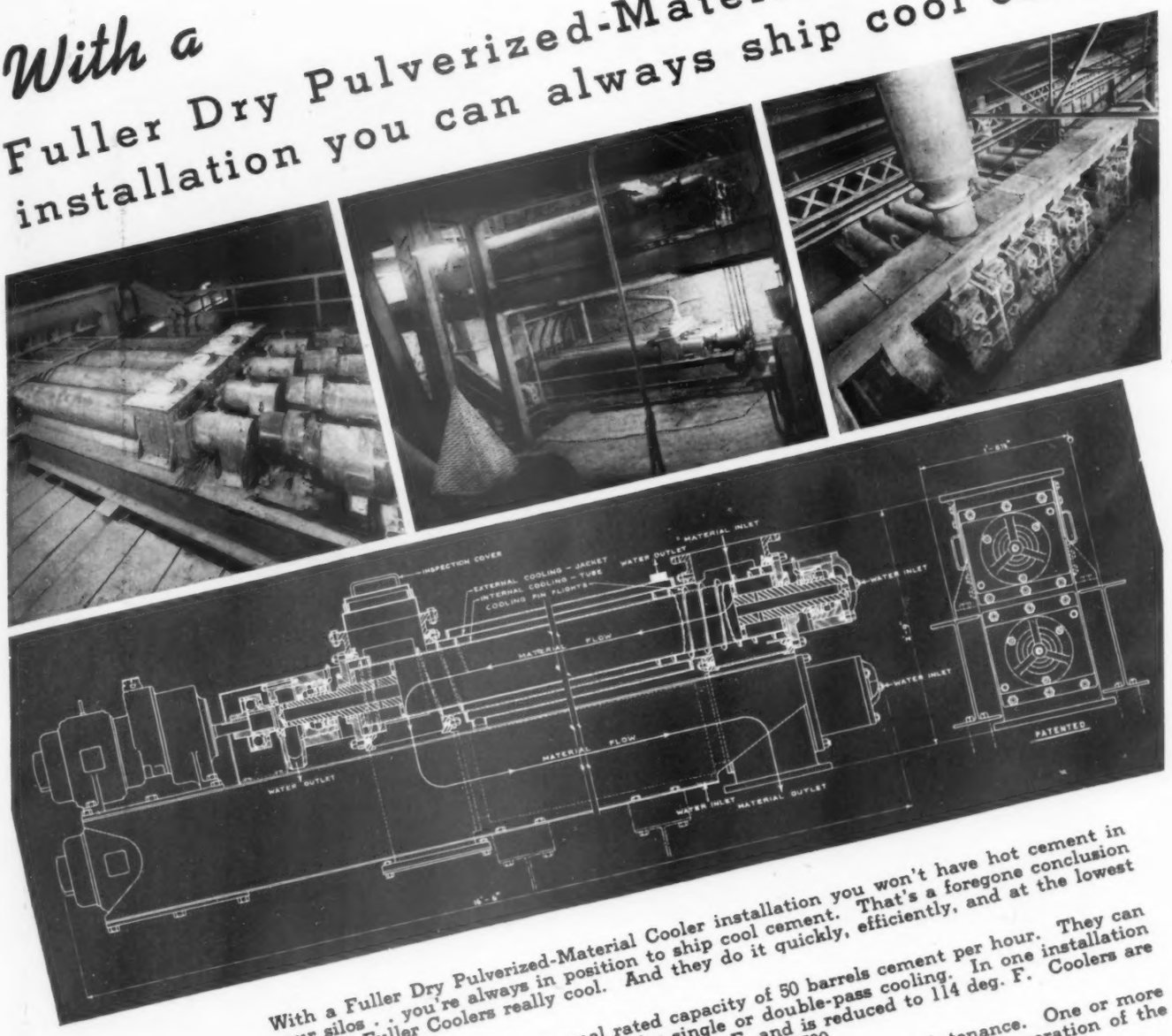


WOOD'S MODERN GROUP DRIVES...
DIRECT CONNECTED DRIVES...V-BELT DRIVES

T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

BRANCHES: 387-391 ATLANTIC AVE., BOSTON, MASS. • 83 PLANE ST., NEWARK, N. J. • 425 FIRST AVE., PITTSBURGH, PA.

With a Fuller Dry Pulverized-Material Cooler installation you can always ship cool cement



With a Fuller Dry Pulverized-Material Cooler installation you won't have hot cement in your silos . . . you're always in position to ship cool cement. That's a foregone conclusion because, Fuller Coolers really cool. And they do it quickly, efficiently, and at the lowest possible cost.

Each cooler unit has a normal rated capacity of 50 barrels cement per hour. They can be installed in parallel or in series, for single or double-pass cooling. In one installation cement is delivered to the coolers at 260 deg. F. and is reduced to 114 deg. F. Coolers are handling cement having a surface area as high as 2700.

Simple in design, efficient, low in power consumption and maintenance. One or more units may be shut down for inspection or repairs without affecting the operation of the other units. The internal mechanism is readily accessible.

Make your plans now and be ready to install Fuller Coolers at the first opportunity.

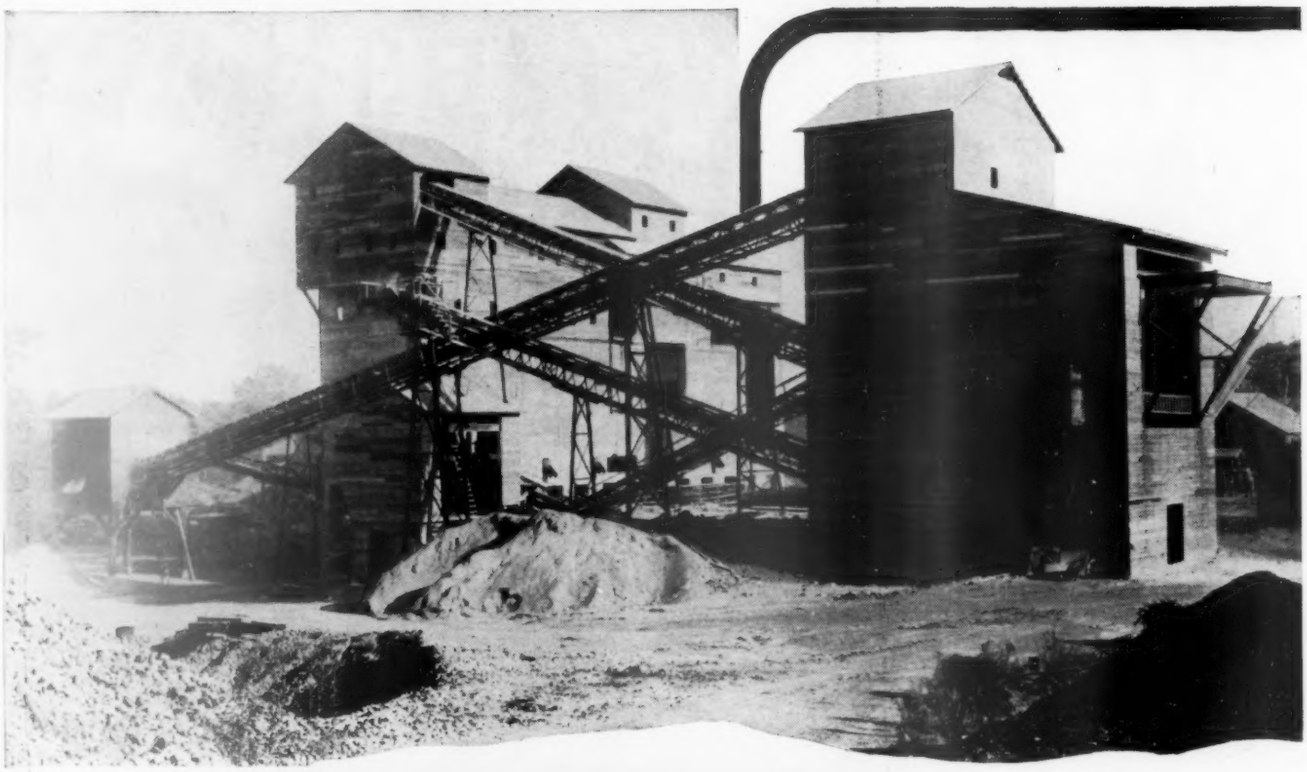
FULLER COMPANY, CATASAUQUA, PA.

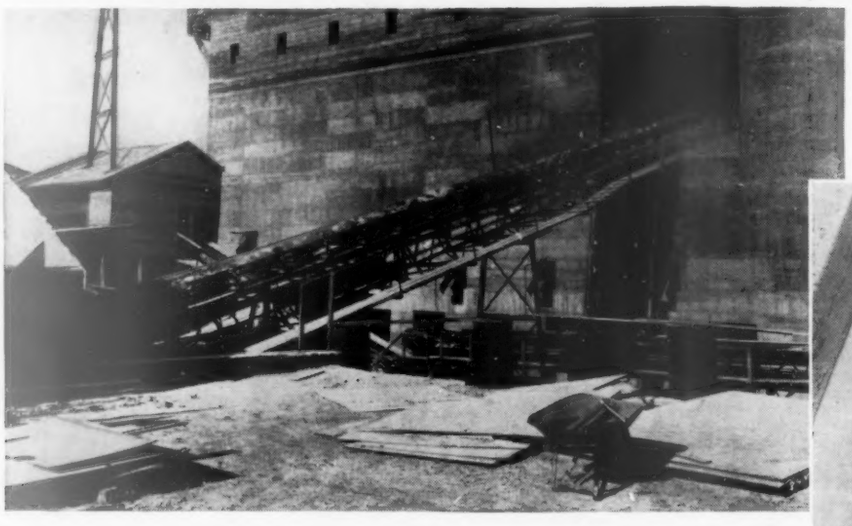
Chicago 3 : 1144 Marquette Bldg.
San Francisco 4 : 421 Chancery Bldg.
Washington 5, D. C. : 618 Colorado Bldg.

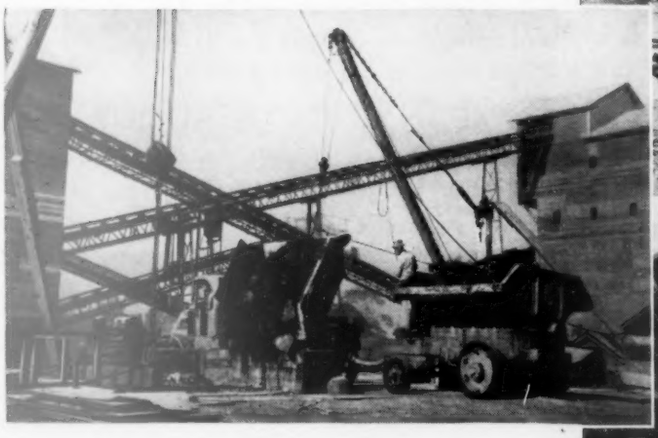
FULLER COMPANY

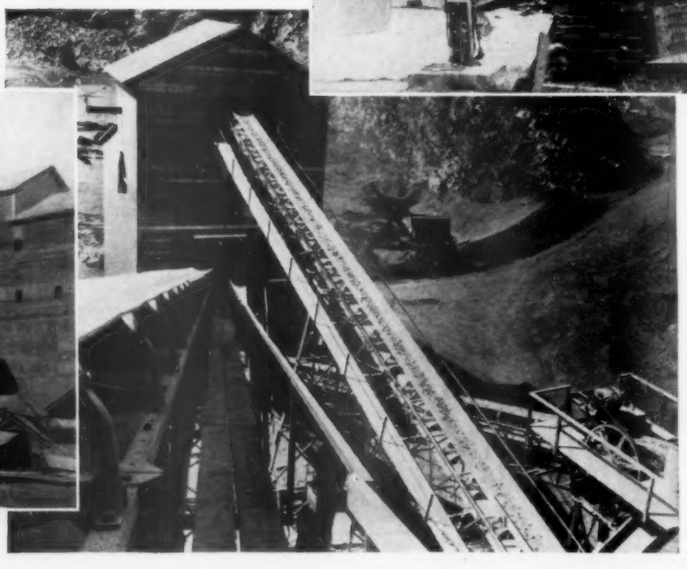
FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

PMC-6

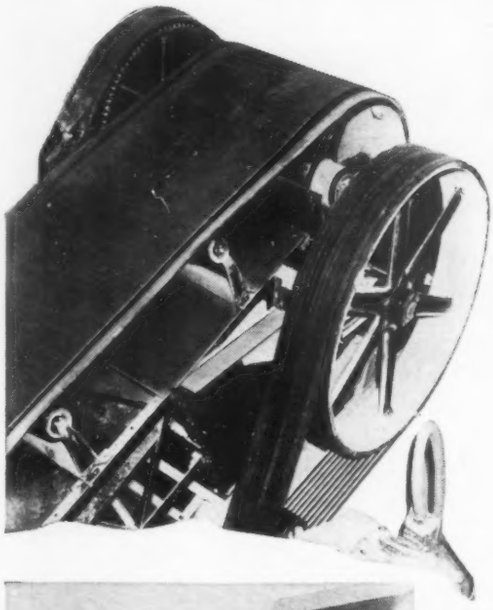


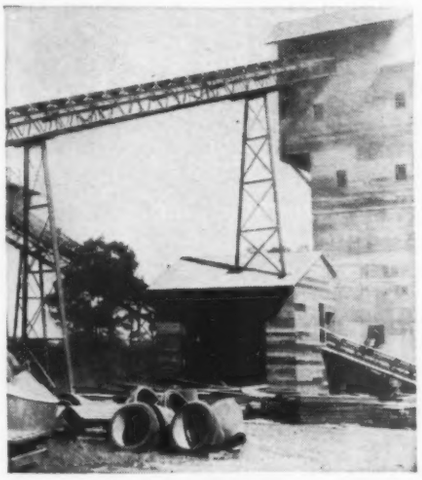






HOW B G STANDARDIZATION MAKES CONVEYOR INSTALLATION *Quicker and Easier!*





STANDARDIZED Barber-Greene equipment will fit your *custom-built* plant perfectly. It is *pre-engineered,* tested and rated.

This entire B-G Conveyor system, fitting perfectly the new plant for Old Colony Crushed Stone Company at Quincy, Massachusetts, was erected by Old Colony men quickly . . . easily . . . and at low cost.

Merely bolt the main sections of a B-G Conveyor together and it's ready for work—units arrive on the job conveniently marked and ready for erection.

B-G standardization saves days of precious time. There's no delay for estimates on cost—our engineers can give you a quotation quickly. No long weeks of waiting for engineering detailing and fabrication—B-G Conveyors, normally, are supplied from stock and shipped shortly after ordered.

Profit by These B-G Features

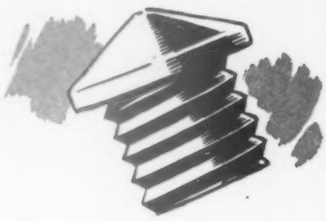
You benefit by B-G standardization in several other ways, too—by low first cost, by the economy of interchangeability, by a flexibility that permits rapid addition, rearrangement or relocation when the system is altered or moved. Factory assembly guarantees correct alignment in erection—reduces belt wear and maintenance.

B-G Conveyors are built in a wide range of sizes, forms and capacities to handle a great variety of materials. For complete information on the many advantages of standardization, see your nearest B-G representative. Barber-Greene Company, Aurora, Illinois.

44-29

Barber-Greene B G *Constant Flow Equipment*

Typical of the exhaustive field tests which marked the development of the modern, high speed Cummins Diesel, was the gruelling 14-day grind which came to an end on Christmas Day, 1932, at the Indianapolis Speedway. Here, under AAA supervision, a Cummins-powered Indiana truck set a non-stop distance record for trucks: 14,600 miles (5,840 laps of the 2½-mile oval!).



The injector cup wiper is an inconspicuous part of the Cummins Diesel, but its development made a conspicuous contribution to the Cummins Diesel's efficient and economical performance. This patented cup wiper, perfected only after countless modifications in piston design, eliminates carbon on the injector cup, creates additional turbulency, assures more complete combustion.

Metallurgy plays an important role in the Cummins Diesel trend to ever lighter, stronger construction. Example: 5,000 samples were analyzed in selecting the cast iron for the block—a foundry was rebuilt and its methods completely revised—but the increase in tensile strength from 20,000 to 50,000 pounds per square inch more than justified the cost.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

Spade Work

The diesel's higher thermal efficiency was proved many years ago . . . but it took the builders of Cummins Diesels to prove that diesel engine weights and dimensions could be brought within practicable limits. They proved it in 1932 with the original high speed diesel . . . proved it after 14 years of intensive "spade work" in the refinement of lubrication, cooling, metallurgy and many other aspects of design and construction . . . proved it by putting diesels in equipment and on jobs where diesels had never worked before. Today, you will find diesels in virtually every automotive, industrial, and marine service that requires heavy-duty power . . . and if you look closely enough, you'll find a very large proportion of those diesels are Cummins Dependable Diesels.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

By using big rubber-tired Tournapulls with LeTourneau 15-yd. Carryall Scrapers, you get more speed— up to 14.9 m.p.h.—to more profitably move overburden over long hauls. Tournapulls steer and operate like a track-type tractor, flotation of big rubber tires enables them to work practically anywhere a tractor will go. Over 2300 now in use; investigate the profit possibilities fast-moving Tournapulls offer you.

4 REASONS WHY LeTOURNEAU CARRYALL SCRAPERS CAN LOWER YOUR STRIPPING COSTS

TAKE full advantage of the economies of stripping with LeTourneau Carryall Scrapers — either tractor or Tournapull operated — on your pit and quarry work. Used today by scores of successful operators. Here's why —

SELF-CONTAINED — Carryall excavates its own loads, then hauls and spreads those loads of overburden in one continuous operating cycle. One man operates both Carryall and prime mover.

GREATER OPERATING RANGE — Carryalls are not limited by boom or casting length. With them you can move overburden beyond range of future operations . . . thus eliminate rehandling.

EFFICIENT ON BOTH LIGHT AND HEAVY OVERBURDEN — LeTourneau Carryalls strip big loads as efficiently on 6 inches of overburden as they do on a 30-foot layer. This reduces clean-up time . . . enables most pit and quarry owners to handle the entire stripping job with Carryalls; others use this method for stripping excess overburden down to profitable shovel or dragline reach.

EXTRA USES — In addition to stripping, you can use your LeTourneau Carryall Scrapers to:

- ★ DIG SAND AND GRAVEL
- ★ STOCKPILE AGGREGATES
- ★ LOAD CAR AND TRUCKS BY RAMP
- ★ FEED HOPPERS
- ★ BUILD AND MAINTAIN BETTER HAUL ROADS
- ★ BUILD RAILROAD GRADES
- ★ DIG DRAINAGE DITCHES
- ★ MOVE EXISTING SPOIL BANKS

Investigate the LeTourneau Carryall method of stripping NOW. You'll save money on both manpower and equipment investment — no big expensive loading equipment or extra trucks needed when you use Carryalls. Our Field Engineering Department will gladly prepare plans and estimates to fit your operation. Call on them TODAY.

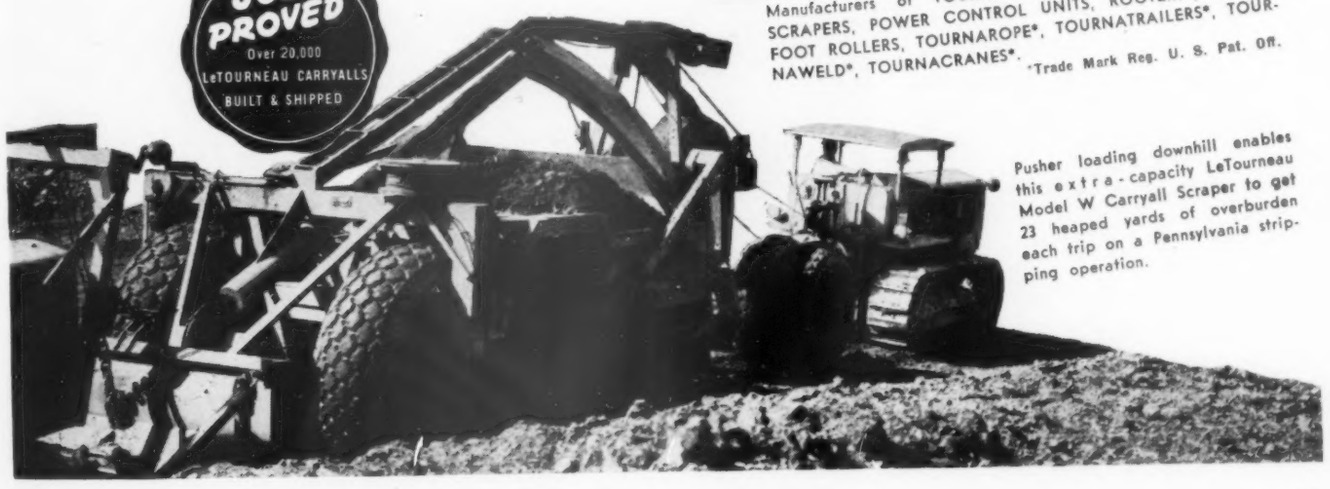
LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

Manufacturers of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, SHEEP'S FOOT ROLLERS, TOURNAROPE*, TOURNATRAILERS*, TOURNAWELD*, TOURNACRANES*.

*Trade Mark Reg. U. S. Pat. Off.

JOB-PROVED
Over 20,000
LeTOURNEAU CARRYALLS
BUILT & SHIPPED



Pusher loading downhill enables this extra-capacity LeTourneau Model W Carryall Scraper to get 23 heaped yards of overburden each trip on a Pennsylvania stripping operation.

KEEP PLENTY OF AIR "ON TAP"

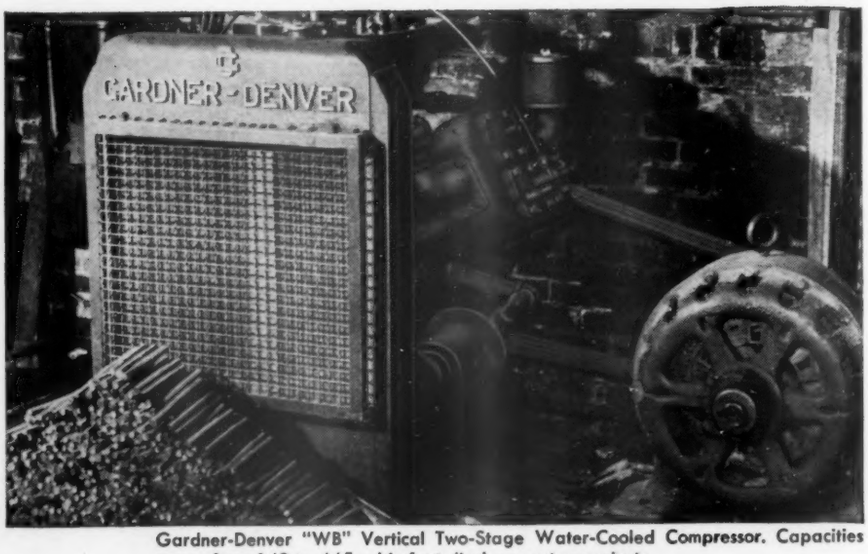
for all vital needs

THERE'S always air for every purpose —if your compressor is a Gardner-Denver.

For these dependable compressors are designed to furnish a consistent supply of compressed air, regardless of the severity of service . . . to have plenty of air on hand for rock drills, sinkers, breakers, spaders and all your air tools at all times.

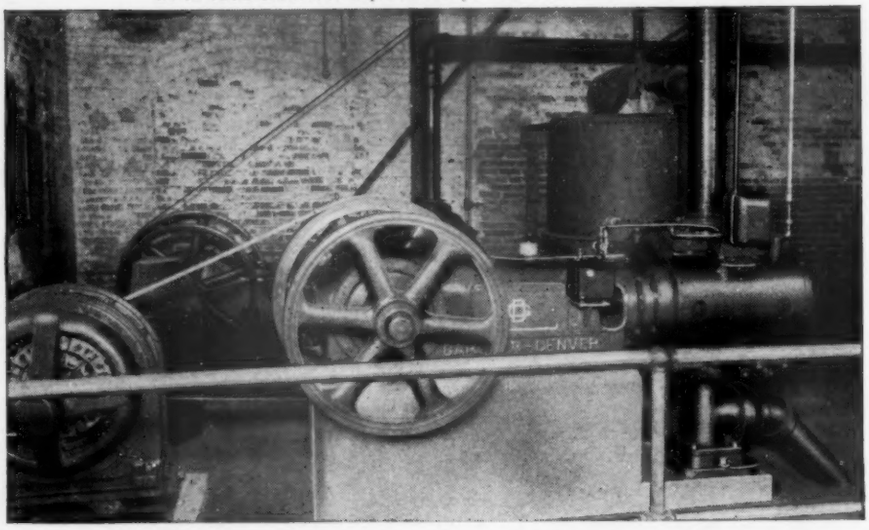
The rugged construction of Gardner-Denver compressors with vital parts cast in GarDurloy and Timken roller main bearings means low maintenance and long life.

For complete information and specifications on Gardner-Denver compressors, for permanent or semi-portable installation, write Gardner-Denver Company, Quincy, Illinois.

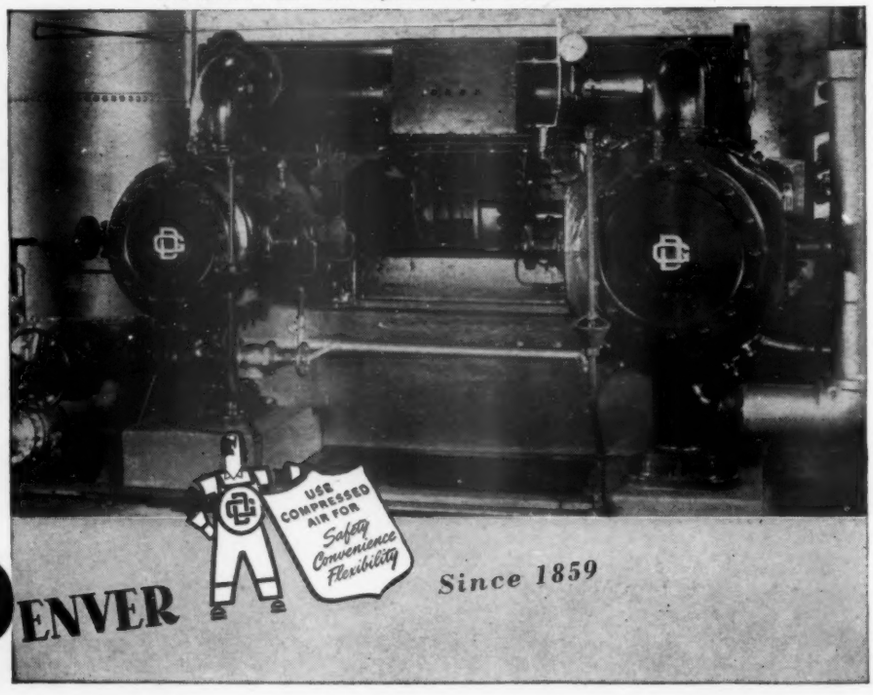


Gardner-Denver "WB" Vertical Two-Stage Water-Cooled Compressor. Capacities range from 142 to 445 cubic feet displacement per minute.

Gardner-Denver "RX" Single-Stage Horizontal Compressor. Capacities range from 89 to 1292 cubic feet displacement per minute.



Gardner-Denver "HA" Two-Stage Horizontal Compressor. Capacities range from 316 to 2012 cubic feet displacement per minute.



GARDNER-DENVER Since 1859

TAMPTITE

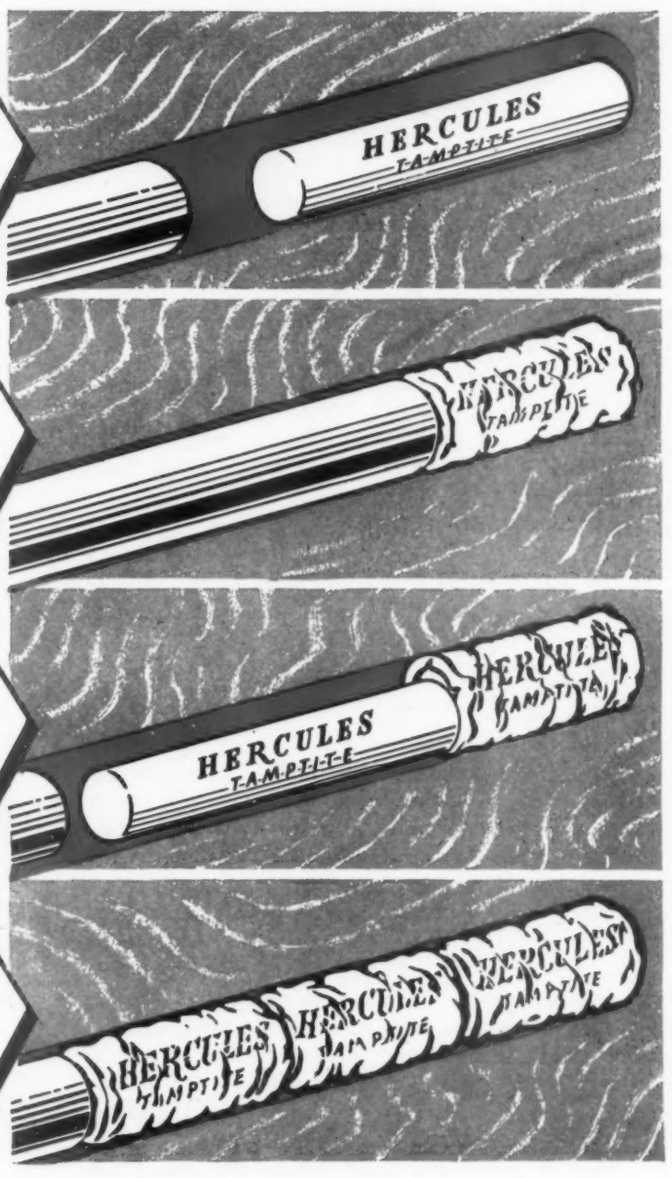
SAVES TIME · SAVES LABOR · PACKS SNUGLY · GIVES BETTER BREAKAGE

1 With Tamptite, you load your favorite Hercules explosive into the bore hole in the usual manner. There's no need to split the cartridge. That saves time and eliminates loose, spilled powder.

2 Next, the tamping rod compresses the dynamite in the hole, packs the charge tightly. There is practically no air space remaining around the charge.

3 Insert another Tamptite cartridge. Then, simply tamp the same as the first cartridge. Continue inserting and tamping cartridges for whatever loading you wish.

4 Your charge is concentrated snugly for maximum blasting effectiveness. The result is better breakage of ore or rock, speedier mucking, and a faster mining cycle.



Order your favorite Hercules explosives in Tamptite cartridges. All the customary grades and sizes of Hercules Gelamites*, Hercomites*, Extra Gelatins, Gelatins, and Extra Dynamites are available in this time-saving wrapper.

HERCULES
EXPLOSIVES

*REG. U. S. PAT. OFF. XR-45

HERCULES POWDER COMPANY INCORPORATED .... 960 KING STREET · WILMINGTON 99, DELAWARE

ORDER HERCULES EXPLOSIVES IN TAMPTITE CARTRIDGES

TALK ABOUT CONVERSION—

Read These Facts!

Before—

Beu & Sons, Sumner, Iowa, "190-G" Universal crushing, screening and loading plant with 10"x36" jaw crusher, is shown producing aggregates near Pine Lake State Park, Hardin County, Iowa. Output averaged 1,500 yards per 10½ hour day from an unusually deep pit and ran as high as 2,200 yards in a 12½ hour day.

This progressive contractor recently took a contract for agricultural limestone in northern Iowa.

After—

The jaw crusher on the "190-G" was readily replaced by a Universal No. 4 hammermill and a Universal primary unit consisting of a 20" x 36" roller bearing jaw crusher with apron feeder was added providing a "tailor made" plant capable of handling the new contract. The revamped plant is shown operating near Ackley, Iowa. As much as 125 tons of aglime per hour have been turned out, averaging better than 100 tons per hour.

This is another case where standard Universal units were economically used to readily convert a plant. There is no end to the variety of combinations that are possible using standard Universal "packaged units."

Handle aggregates today, riprap tomorrow, ballast next month.

Universal engineers and field men have the answers to your conversion problems.

UNIVERSAL ENGINEERING CORP.
619 C Avenue, West · Cedar Rapids, Iowa

ARMY NAVY

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!

The customer who drops in at a Thermoid branch office, or visits a Thermoid factory, usually makes two impressive discoveries:

***FIRST**—the sincerity of everyone's interest in his call; and*
***SECOND**—the number of persons he sees wearing emblems that resemble the ones pictured here.*

Actually, these phenomena are inseparable twins. Both are born of a policy instituted by Thermoid many years ago . . . a policy of company recognitions and rewards that encourage each employee to see himself as an active partner in the one, important business of advancing the common welfare of himself, his employer, his fellow workers and every Thermoid customer. Today, as just one result of that policy, over 300 Thermoid men and women proudly wear service medals representing from 10 years to 50 years of continuous employment with us.

The sense of proprietorship and personal responsibility felt by Thermoid employees is among our most valued assets. It marks a spirit of co-operation that gets things done—and done *right* . . . the spirit that causes Thermoid customers to say: "It's good business to do business with Thermoid."

Thermoid Rubber

DIVISION OF THERMOID COMPANY

TRENTON, NEW JERSEY

DON'T PUT IT OFF 'TIL TOMORROW—
Buy More War Bonds Today!

THE THERMOID LINE INCLUDES: **TRANSMISSION BELTING • F. H. P. AND MULTIPLE V-BELTS AND DRIVES • CONVEYOR BELTING • ELEVATOR BELTING • WRAPPED AND MOLDED HOSE • SHEET PACKINGS • INDUSTRIAL BRAKE LININGS AND FRICTION PRODUCTS • MOLDED HARD RUBBER AND PLASTIC PRODUCTS.**

It's Good Business to Do Business with Thermoid

Two on the Aisle at the Beach-Head Bijou

The empty rope reels our fighting men sometimes use in their improvised theatres can mean but one thing . . . that our engineers are using plenty of tough, dependable wire rope in the operation of cranes, shovels, draglines and bulldozers.

Add to these demands the requirements of the industries providing supplies for our fighters, and it's easy to see that in spite of greater production there still isn't enough Wickwire Spencer Wire Rope to meet all demands.

To help conserve wire rope we suggest that you send for copies of our book, "Know Your Ropes," which is packed with ideas to help make wire rope last longer. And, when you do need rope, get WISS-COLAY *Pre*formed. It not only lasts longer than the non-preformed, but it's easier to cut, splice and install; it's kink-resistant and safer to handle.

If you have a particular wire rope problem our wire rope engineers will be happy to be of service. Write Wickwire Spencer Steel Company, 500 Fifth Ave., New York 18, N. Y.

PROPER SHEAVE LOCATION LENGTHENS ROPE LIFE

Increasing the distance between the main sheave and the drum will reduce side wear of the rope. This and 39 other wire rope life savers; 78 "right and wrong" illustrations; 20 diagrams and charts—are all in our 82 page book, "Know Your Ropes."

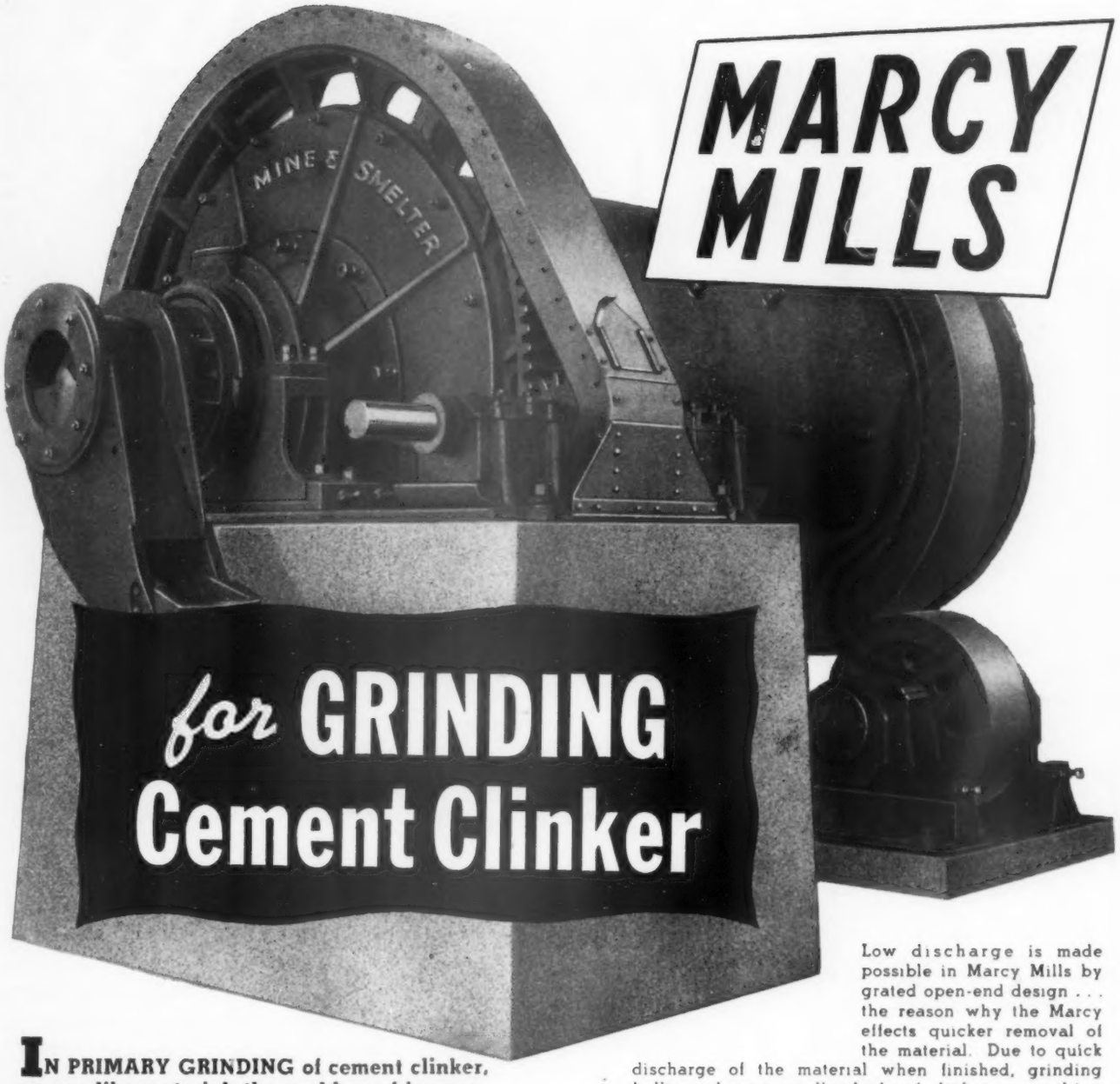
SEND FOR YOUR FREE COPY

Send your wire rope questions to:

WICKWIRE SPENCER STEEL COMPANY

500 FIFTH AVENUE, NEW YORK 18, N. Y.

Abilene · Buffalo · Chattanooga · Chicago · Detroit · Houston · Los Angeles · Philadelphia · San Francisco · Tulsa · Worcester



MARCY MILLS

for GRINDING Cement Clinker

Low discharge is made possible in Marcy Mills by grated open-end design . . . the reason why the Marcy effects quicker removal of the material. Due to quick discharge of the material when finished, grinding balls work on a smaller body of clinker — resulting in more useful work from the grinding media.

IN PRIMARY GRINDING of cement clinker, or any like material, the problem of increasing tonnage is usually considered a matter of increasing the SIZE of the grinding units. Without using a larger mill, the Marcy gets more tonnage—and lower grinding cost per ton — simply by discharging the product from the mill as soon as the grinding is completed, without wasteful over-grinding . . . . If you are now planning for tomorrow's necessarily lower costs, let us have a look at your drafting boards.

Main Office: Denver, Colorado, U.S.A.
El Paso, Salt Lake City, 1775 Broadway, N.Y.
Canadian Vickers, Ltd., Montreal
W. R. Judson, Santiago and Lima

Genuine Wilfley Tables; Massco-McCarthy Hot Millers; Rock Bit Grinders; Density Controllers; Belt Feeders; Pinch Valves; LABORATORY EQUIPMENT; MINE & MILL SUPPLIES; COMPLETE MILLING PLANTS.

The Mine & Smelter SUPPLY CO.

LET'S TAKE "KVS" FEATURES 1 BY 1 . . .

MOST CRUSHING WITH LEAST POWER

NO GEARS

THE FIVE "KVS" FEATURES

1 POWER SAVING. No power lost in gears. No gears . . . all power goes to CRUSHING.

2 CAPACITY. Size for size, will OUTCRUSH any crusher now made.

3 LOW MAINTENANCE COST. Entire interior easily, quickly accessible. Forced feed lubrication.

4 LONG LIFE. Solid-anvil concaves that take the crushing wear can be reversed, giving prolonged life at vital point.

5 EFFICIENCY. Quick, simple adjustment of size opening. Suspension of shaft on spring release head protects against tramp-iron. The ONLY crusher using spring release that makes possible crushing on SOLID-ANVIL CONCAVES.

Power costs good money. You get more tons crushed per h.p. put into a Kennedy-Van Saun Ball Bearing Gearless Gyratory BECAUSE IT IS GEARLESS. Power is applied DIRECT to a pulley running on ball bearings. And it gets right to the crushing point without waste or loss. But that's only ONE feature of these strong, simple crushers; just ONE reason why, size for size, it will crush more, for less money and trouble, than any crusher made. Built in a wide range of sizes and capacities for primary and secondary crushing. More details.

• WRITE FOR CATALOG

Ball Bearing Gearless Short Shaft Standard Crusher with synchronous motor built-in pulley.

• We have a very large line of mining, crushing, cement, lime burning, and pulverized coal equipment. If interested write for special Bulletin.

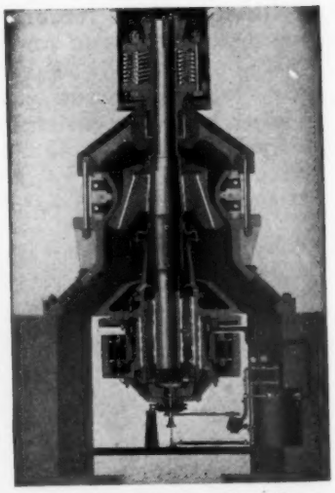
KENNEDY-VAN SAUN

MFG. & ENG. CORPORATION

Representatives in all principal U. S. Cities

2 PARK AVENUE
NEW YORK, N. Y.

Factory
DANVILLE, PA.



Ball Bearing Gearless Type Low-Head Crusher for fine crushing.

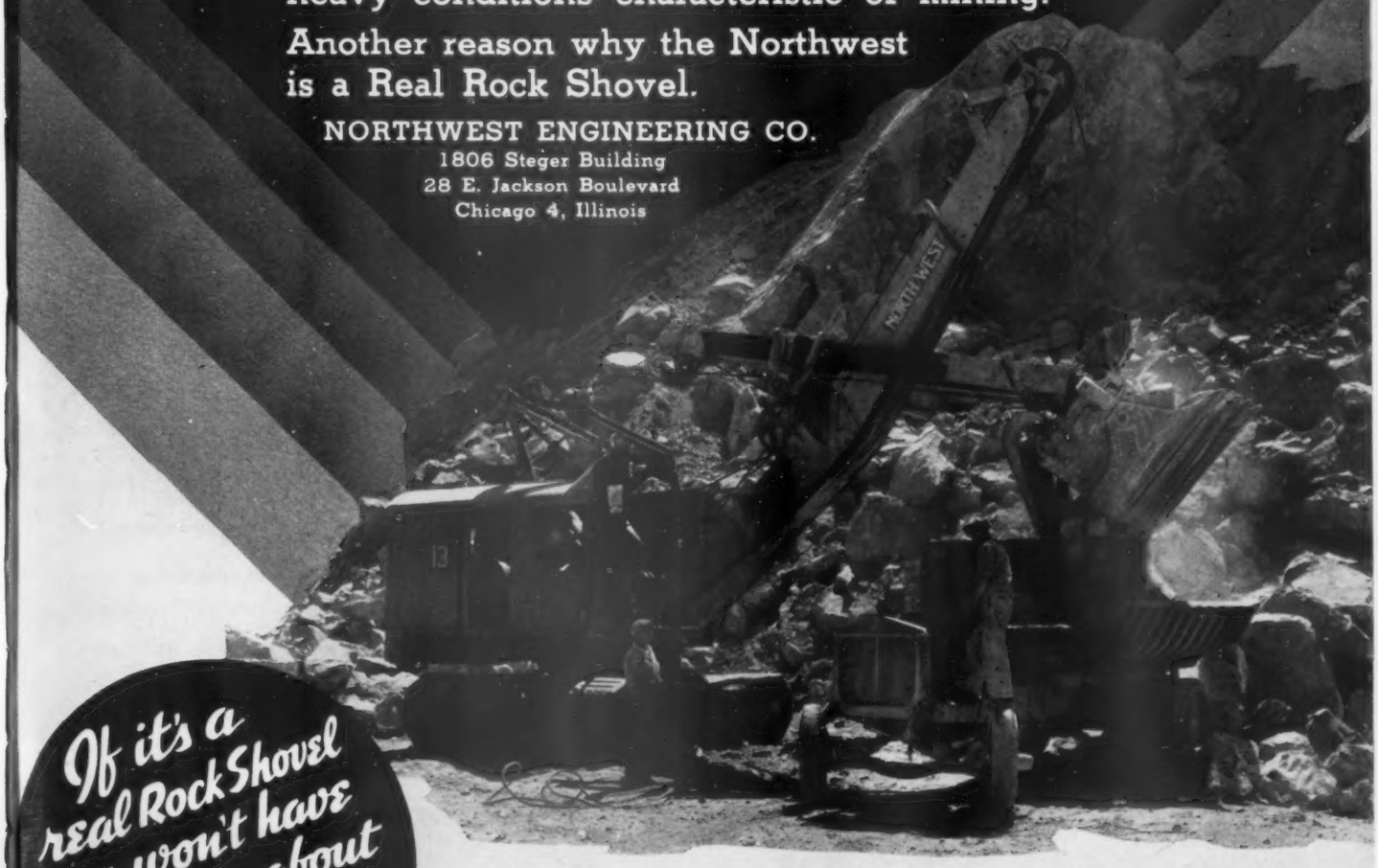
SWING CLUTCHES

Quick shovel information for the man that OK's the purchase of shovels.

THE most used and abused piece assembly on any mining shovel! Northwest Swing Clutches are uniform pressure clutches. No band type clutch *can be a uniform pressure clutch.* Northwest uniform pressure clutches mean smoother engagement, cooler running, less frequent adjustment and longer life under the heavy conditions characteristic of mining.

Another reason why the Northwest is a Real Rock Shovel.

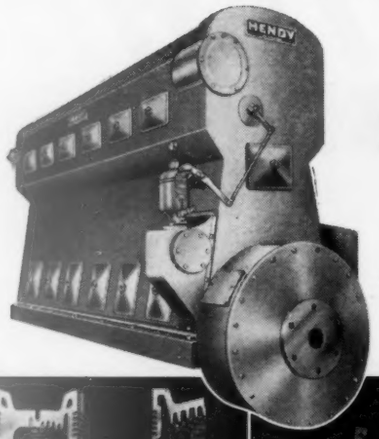
NORTHWEST ENGINEERING CO.
1806 Steger Building
28 E. Jackson Boulevard
Chicago 4, Illinois



If it's a real Rock Shovel you won't have to worry about output in dirt

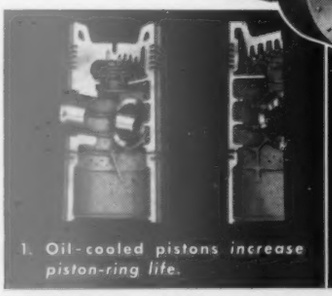
NORTHWEST

Convertible for any Mining, Material Handling or Excavation Problem



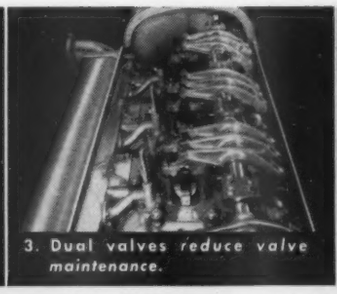
22 PROVEN DIESEL FEATURES

ONLY HENDY COMBINES THEM ALL



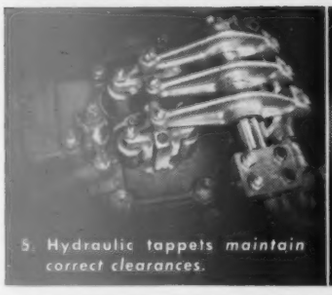
1. Oil-cooled pistons *increase piston-ring life.*

2. Unit fuel injectors *eliminate high-pressure lines.*

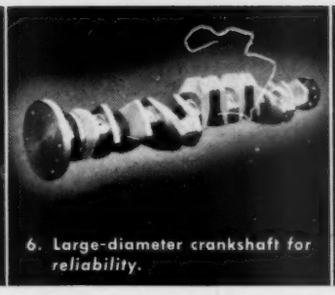


3. Dual valves *reduce valve maintenance.*

4. Overhead camshaft *eliminates push-rod linkages.*

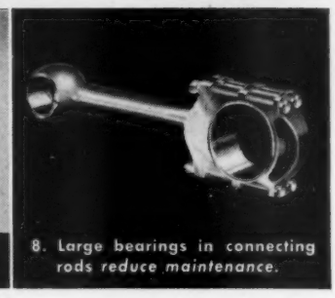


5. Hydraulic tappets *maintain correct clearances.*



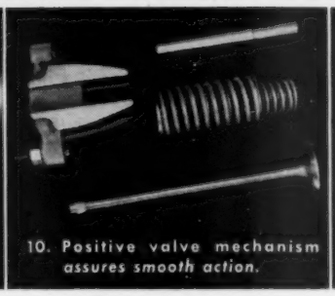
6. Large-diameter crankshaft for *reliability.*

7. Simplified controls *aid easy operation.*

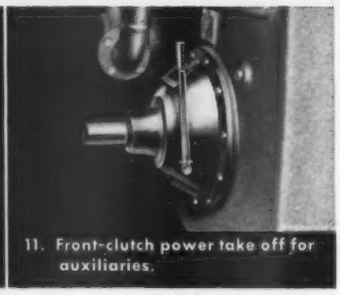


8. Large bearings in connecting rods *reduce maintenance.*

9. Welded steel bedplate *assures great rigidity.*



10. Positive valve mechanism *assures smooth action.*



11. Front-clutch power take off for auxiliaries.

OTHER FEATURES *not pictured here*

12. Removable main bearings
13. Double rear main bearings
14. Jet-action head cooling
15. Cage-type relief valves
16. Uniform-tension camshaft drive
17. Air-operated starting valve
18. Large-capacity cooling pumps
19. Mechanical or hydraulic governor
20. Water-cooled exhaust manifold
21. Fresh-water cooling
22. Full pressure lubrication

THE important fact about Hendy Diesels is that they combine, for the first time in a single engine, 22 of the most modern design features. Every one of these features was selected by Hendy engineers as a proven and practical development in Diesel design.

Only Hendy Diesels have all twenty-two! Examine the full list above—you are undoubtedly familiar with some—you'll want to know more about the others. Send for data available now on 6 or 8 cylinder Hendy Diesels from 350 to 675 hp, designed for a wide variety of industrial uses or with generators as complete electric plants.

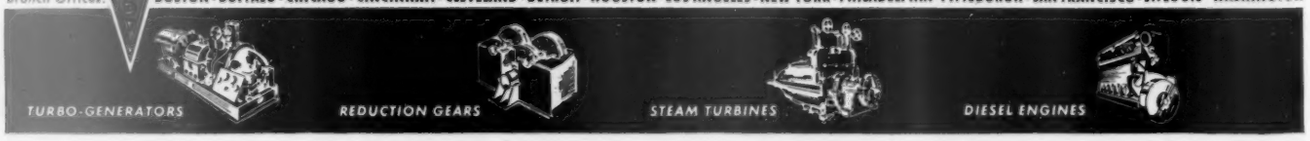
JOSHUA HENDY IRON WORKS

ESTABLISHED 1856

SUNNYVALE, CALIFORNIA

65-D-10

Branch Offices: BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • ST. LOUIS • WASHINGTON



AMERICA IS
Built with Aggregate!
SMOOTHER BEDS
for RAILROADS!
Building the nation's vast network of railroads created a market for countless millions of tons of aggregate and each year millions more should be added to keep them smooth. During the past few years this has been impossible because of labor shortages.
The outlook now is for ballast to be one of the big markets for producers of crushed stone and gravel. The railroads have plenty of funds available for track maintenance and, if the supply of labor permits, they will use it for that purpose.
Cedarapids aggregate producing
and crushing equipment will help you produce better aggregate for ballast, highways, airports and other construction jobs, and it will cost you less too. Remember this — the Cedarapids line is complete and will meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or a single piece of equipment. You'll be way ahead if you come to Iowa now for your essential needs and be one of the first in line for postwar deliveries. See your Iowa dealer right away or write direct.
IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA
CEDAR RAPIDS
ARMY E NAVY
Ewing Galloway Photo
Cedarapids
Built by IOWA
THE IOWA LINE
of Material Handling Equipment Includes
ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

Why "NITRAMON" C is a natural for tunnel shots...

it's safer and speeds up the job

IN RECENT YEARS the use of "Nitramon" C for coyote tunnel shots has steadily increased.

Why? Because "Nitramon" C is safer to handle than the dynamites formerly used for such work . . . and it speeds up the job. Unlike conventional explosives, "Nitramon" C cannot be detonated by flame, friction, the strongest commercial blasting cap, falling objects or even the impact of rifle bullets! It must be fired by using a "Nitramon" Primer.

Because it is safer to handle and non-headache-producing, crews find that tunnel loading is easier and quicker. "Nitramon" C also permits the safe use of lighting circuits in tunnels to further speed up the work and help prevent accidents. Packed in watertight containers, "Nitramon" C stacks up readily and stays in place. And when loaded on the same energy basis, it costs less than dynamite.

Check the advantages of "Nitramon" C. It's a "natural" for tunnel shots. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT
REG. U.S. PAT. OFF.

"NITRAMON" should always be detonated by a combination of "Nitramon" Primer and "Primacord."

DU PONT "NITRAMON" C

THE SAFEST BLASTING AGENT

Cement for Calais...

Chemicals for China... Foodstuffs against "Festung Europa"

MUCH of what it takes to fight a war—and to feed the fighting, liberated and home fronts . . . travels today in tough kraft shipping sacks . . . paper sacks that are dust- dirt- vermin- and moisture-proof.

Multiwalls stand up under the most rugged handling and neither salt water nor sun nor rain nor heat nor cold nor gas nor smoke impairs their efficiency. Multiwalls store and stack easily and losses through spoilage, sifting and infestation are infinitesimal.

Multiwall paper bags . . . the preferred industrial peacetime packages . . . are now delivering more than 300 materials for Victory, products ranging from abrasives and asphalt to zinc and zerconite.

Multiwall Paper Bags are required for industrial shipments of food products, chemicals, fertilizers, and construction materials — for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION

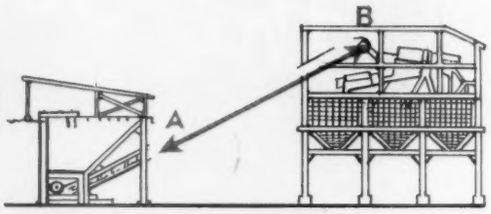
NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA:
BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, British Columbia

Boston, Mass. Birmingham, Ala. Dallas, Tex. Denver, Colo.
No. Kansas City, Mo. Los Angeles, Calif. New Orleans, La.
Franklin, Va. Seattle, Wash. Nazareth, Pa. Toledo, Ohio

2 ways
TO BUY A BELT CONVEYOR

THE PROBLEM: A New Belt Conveyor is required to handle 300 tons per hour between points A and B.



OLD METHOD
Doing the Job Yourself

1. Design and Engineer the Conveyor System.

2. Select, purchase and obtain delivery from several sources, a variety of equipment.

IDLERS ----
PULLEYS -----
BEARINGS ----------
BELTING -----
MOTOR ----------
DRIVE ---
FRAMEWORK -------

3. Put together on the Job. Time consumed in

CUTTING AND DRILLING
ERECTION
ASSEMBLY
FITTING AND FUSSING
INSTRUCTING LABOR
REDESIGNING UNTIL
IT WORKS

NEW METHOD
Assign the Job to Pioneer

1. Make a few simple measurements and write an outline of requirements.

2. Order from Pioneer — a Single Source of Supply and Responsibility.

3. Receive a Pioneer Belt Conveyor—complete in every detail and all ready for quick, economical erection.

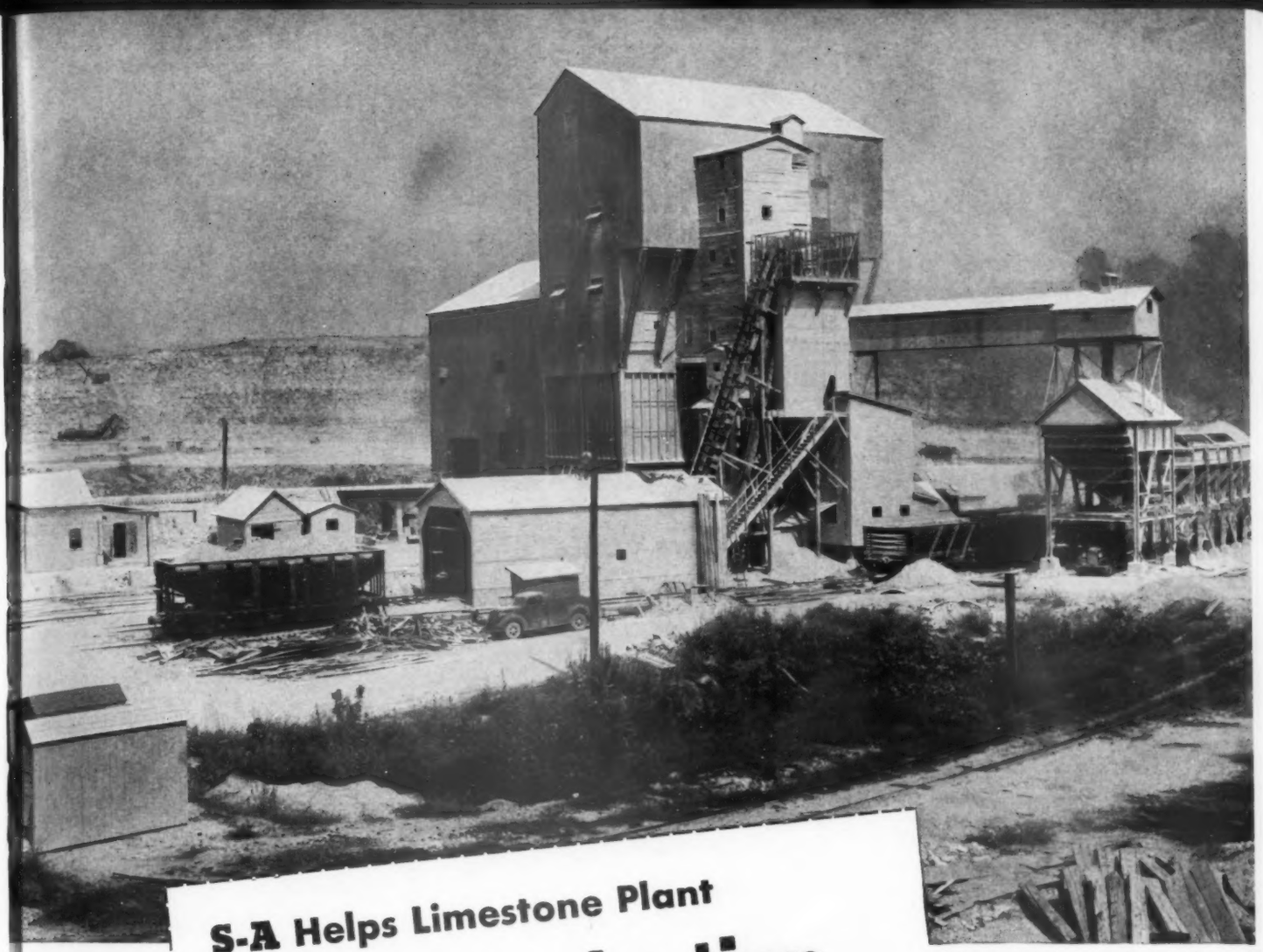
PIONEER Engineers and Manufactures Belt Conveyors consisting of Frames, Idlers, terminal equipment, motors and drives . . . guaranteed satisfaction.

PLAN WITH

Pioneer
ENGINEERING WORKS
ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY
Jaw Crushers • Roll Crushers • Screens • Conveyors • Feeders • Washers
MINNEAPOLIS 13, MINNESOTA

FOR PROFITABLE PRODUCTION

YOUR CONVEYOR problems receive prompt and careful attention at Pioneer . . . Write for recommendations, quotations and illustrated descriptive literature on Pioneer Belt Conveyors.



The Columbia Quarry Krause plant in which all material handling equipment for the new expansion was furnished by Stephens-Adamson.

S-A Helps Limestone Plant

Boost Production

To Meet Huge Demand

When greatly increased demand for agricultural limestone taxed the capacity of Columbia Quarry Company's plant at Krause, Illinois, the company decided to install new handling and pulverizing equipment. It is a matter of pride to Stephens-Adamson that it was among those called in to help design and install the necessary new machinery.

Helping rock producers expand their operations with efficient, designed-to-the-job equipment is a familiar role to S-A engineers. It's a job they have been doing for the 43 years S-A has specialized in the development of better material handling methods and equipment.

When you plan to improve or expand your facilities, take advantage of this two-way S-A service: (1) the ability to design exactly the system you need for fast, low cost handling, using (2) the right equipment selected from the complete line of S-A manufactured handling units.

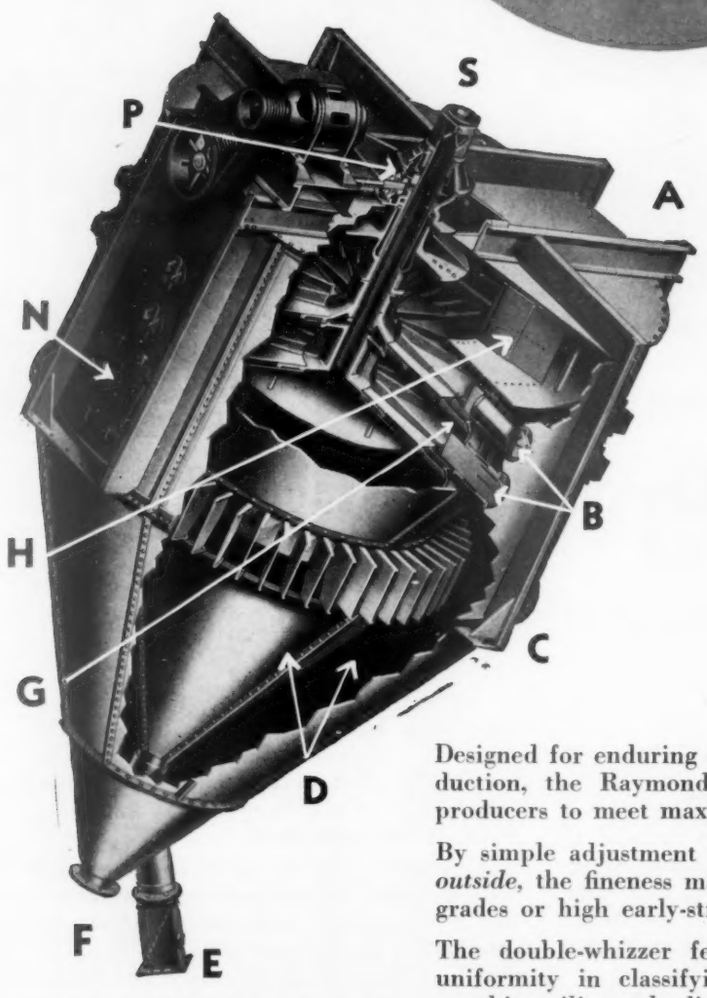
STEPHENS-ADAMSON MFG. CO.

20 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

BULK MATERIAL HANDLING EQUIPMENT

Why THE ROCK MATERIALS WORLD depends on Raymond DOUBLE WHIZZER Mechanical Air Separator



Built in nine sizes from 2'6" to 18'0" diameter. Also 10" Laboratory Separator. Write for Catalog No. 45.

Because of:—

A. Structural Steel Framework
B. Easy External Control
C. Liners at all Wear Points
D. Extra Large Air Chambers
E. Cleaner Tailings
F. Uniform Finished Products
G. Closer Fines Separation
H. Powerful Fan Action
N. Handy Clean-out Doors
P. Automatic Oiling System
S. Center Feed and Centrifugal Distribution

Designed for enduring operation and closely controlled production, the Raymond Mechanical Air Separator enables producers to meet maximum specifications.

By simple adjustment of the vertical damper slides *on the outside*, the fineness may be controlled to provide standard grades or high early-strength cements.

The double-whizzer feature insures extreme fineness and uniformity in classifying lime, gypsum, slate dust, clays, graphite, silica, talc, limestone and the whole range of nonmetallic minerals, chemicals and manufactured products.

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1321 North Branch Street **Chicago 22, Illinois**
Sales Offices in Principal Cities
Canada: Combustion Engineering Corp., Ltd., Montreal

Nitro Starch Base

High Explosive Efficiency

IN MINING · QUARRYING · LOGGING AND CONSTRUCTION

Plus

3 ADVANTAGES FOR YOU!

1 WILL NOT PRODUCE HEADACHES from handling . . . reduces discomfort from breathing muck pile fumes. Better working conditions for you and your men!

2 WILL NOT FREEZE or leak at Arctic or Tropic temperatures. Maintained high efficiency . . . anywhere . . . anytime!

3 WITHSTANDS IMPACT in high-powered Rifle Bullet Test. Greater safety for workers!

★ Today, Trojan Products are helping our fighters blast out critical gains on the roads to Berlin and Tokyo. Efficient weapons of war, Trojan Products are better known for their outstanding performances in peacetime development and construction. More than ever before, those who will use explosives in postwar are depending on Trojan for . . . "the right explosive for the job".

SPEED THE PEACE • BUY MORE BONDS!

EXPLOSIVES 1905 TROJAN 1944 CHEMICALS

POWDER COMPANY

ONE OF AMERICA'S OLDEST HIGH EXPLOSIVES MANUFACTURERS

PLANTS: SEIPLE, PA. • ROBERT, CAL. • MAGAZINES STRATEGICALLY LOCATED THROUGHOUT THE NATION

OFFICES: ALLENTOWN, PA. • SAN FRANCISCO, CAL. • LOS ANGELES, CAL. • PORTLAND, ORE. • NEW YORK, N. Y.

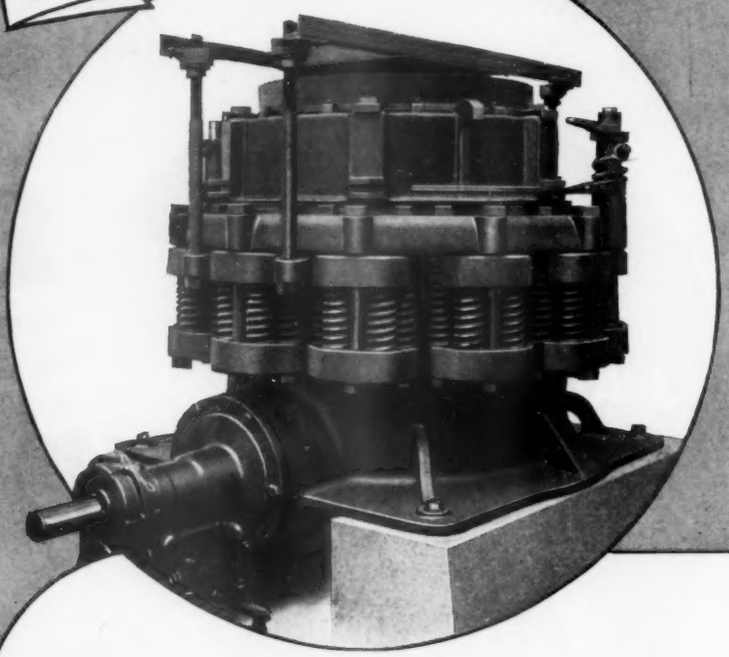
METALS

GRAVEL

STONE

SLAG

For Finer Crushing For All Materials



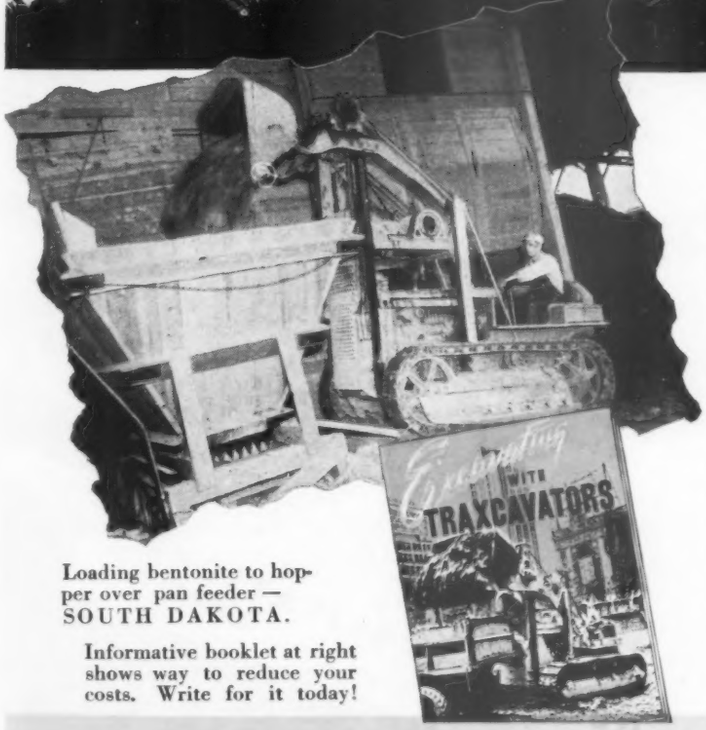
Wherever extremely fine crushing is involved, whether for the recovery of metals or for making materials for airports, roads or other types of construction, the Symons Cone will deliver a more finely crushed product, in greater quantity and at lower cost than can be attained by any other method of crushing. That Cones are being used for most of the larger operations where fine crushing is being done is evidence of advantages found only in this machine.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO

NORDBERG MACHINERY

SYMONS CONE CRUSHERS

HANDLING COSTS BLASTED



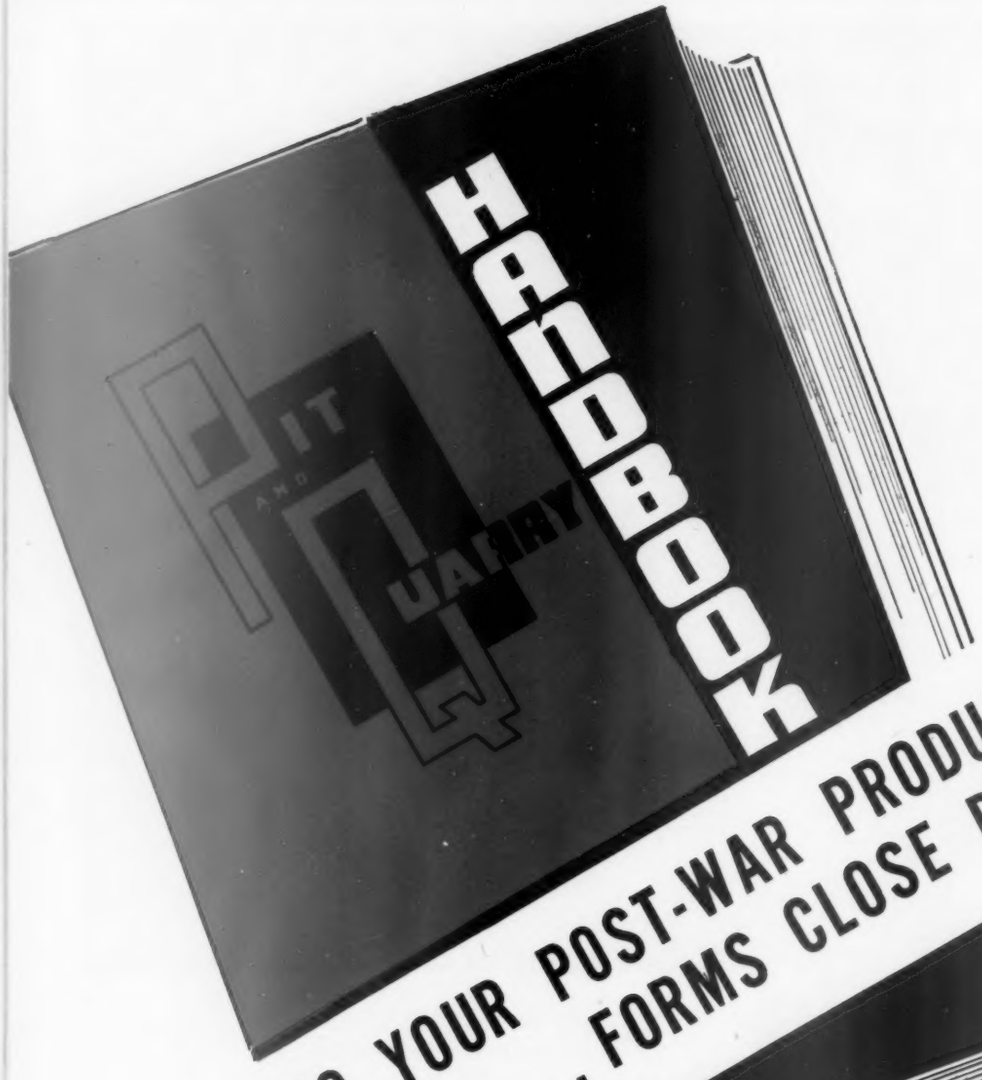
Loading bentonite to hopper over pan feeder — SOUTH DAKOTA.

Informative booklet at right shows way to reduce your costs. Write for it today!

WITH TRAXCAVATORS on the job, handling costs take a terrific blasting! These compact, rugged tractor excavators get into the closest quarters and load out the "pay dirt" in a hurry. The Model T2 TRAXCAVATOR, shown above, in a Pennsylvania limestone quarry loads between 350 and 400 tons of rock in an eight hour day — doing the job easier, faster, and at lower cost than any previously used method. But these versatile, multi-purpose machines do *More!* They maintain haulage roads, do clean-up jobs in the pit and around the plant, drawbar work, and a host of other tasks. Powered by "Caterpillar" track-type tractors, TRAXCAVATORS are unmatched time, money, and labor-savers, are available with bucket capacities from ½ to 2½ cubic yards. See your TRACKSON-"Caterpillar" dealer today, or write for literature to Trackson Company, Milwaukee 1, Wisconsin.

TRAXCAVATOR

The Original Tractor Excavator



CATALOG YOUR POST-WAR PRODUCTS IN THE 1945 EDITION . . . FORMS CLOSE DECEMBER 1

Every indication points to an early cessation of hostilities in Europe, with the end of the Pacific phase of the war in sight some time soon. Construction programs already planned will be the first big post-war project. The nation's pits and quarries will be among the first to benefit . . . among the first to buy needed equipment. Pit and Quarry Handbook is their year 'round production and buying guide and the 1945 edition will be in big demand. Catalog your post-war products in this exclusive manual for these industries. Reach every prospect in over 6,000 plants, pits and quarries . . . get full coverage for the vital 12 months of 1945 in the new edition. *Reserve space now*—forms close December 1.

PIT AND QUARRY PUBLICATIONS
538 SOUTH CLARK ST. CHICAGO 5

KEEPING 'EM BUSY

There are two things about this picture to warm the hearts of miningmen. One is the sight of an important mine in full war production. The other is the sight of husky Mack trucks doing their part to keep every shovel working "all out." Each of these Macks, with their 30-ton load capacity, can move 2,160 tons of earth every 24 hours! No wonder mine operators depend so much on Mack. They know its bed-rock toughness, its down-to-earth operating economy—and its 44-year-old reputation for being *more* truck, ready and able to take more punishment, and do more work. They know from experience what "Built like a Mack" means . . . and what a satisfaction it is to have Macks on the job.

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

Mack Trucks, Inc., Empire State Building, New York, N. Y.
Factories at Allentown, Pa.; Plainfield, N. J.

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

NEW *Sheppard* Installation in Strip Mine

Pioneers NEW Use for Diesel Power

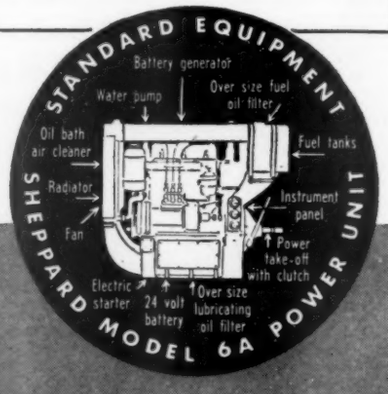
THE Dye Coal Company of Cadiz, Ohio, has just installed a Model 6A Sheppard Diesel as the prime generator of power for maintenance equipment. This is a new use for a Diesel . . . and it points the way to improved operation and substantial power economies in similar installations.

The Sheppard Diesel used by the Dye Coal Company is a Model 6A direct-connected . . . by means of a double engagement flexible coupling . . . to an 18.7 KVA—AC 120/240 volt, 1200 R.P.M. generator. This unit is mounted on a steel beam base and is equipped with an automatic starting control.

The Dye Coal Company will use this Sheppard Diesel to generate light and provide power for operating drill presses, grinders and other small tools in the field repair shop; for repair and maintenance of power shovels, bulldozers, trucks and other equipment for stripping operations. On priority, Sheppard Diesels are available NOW to essential industries. Sheppard Diesels for post-war use in all industries may be "reserved" through the Sheppard Post-Priority Plan. Before buying any Diesel or a substitute power source, check on the availability of Sheppards.

Free Bulletin—JUST PUBLISHED—
Shows Sheppard Pump Applications

Sheppard Diesels are standard equipment on the pumps of many nationally known manufacturers. Sheppard also supplies complete pump units. Learn how Sheppard performance is cutting pumping costs . . . increasing pump output . . . in diversified industries. Write today for free Sheppard pump bulletin . . . just published.



R. H. SHEPPARD COMPANY, HANOVER, PA.

Sheppard
ALL AMERICAN
DIESELS

PRIMACORD for Small Holes

pays off in several ways

FIRST: The use of this insensitive detonating fuse reduces the hazards of loading and firing.

SECOND: Priming and loading each hole with Primacord is easier and quicker than any other method — saves time and labor.

THIRD: The fact that Primacord detonates every cartridge in every hole, means that each cartridge "goes" with the extra force of a primer cartridge. You get more work from your explosives.

Primacord is light in weight, flexible, strong — easily handled by one man. It cannot be set off by ordinary shock, friction or stray electric currents — and must be detonated. Because of its many advantages, operators are finding it profitable to use Primacord *throughout* the quarry.

23

PRIMACORD-BICKFORD
Detonating Fuse
Manufacturers of Safety Fuse since 1836

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

Why deny yourself the satisfaction of Taylor Spiral savings?

OF course you can't "swear off" completely on heavy pipe. It has its place in most plants, but in far too many it has "muscled in" on a lot of jobs that could be far more economically handled by light, but remarkably strong, Taylor Spiral Pipe!

This is probably due to the fact that Standard Thickness is too often considered the starting point on the scale of available pipe thichness . . . which is far from the fact. Way below it—in thickness, in weight, in cost—is Taylor Spiral Pipe.

But *not* way below it in *strength!*

There's a definite reason for this combination of great strength and light weight in Taylor Spiral Pipe. Its spiral seam gives it greater bursting strength, greater collapsing strength, greater longitudinal stiffness than even a seamless pipe of equal wall thickness—makes it the strongest type of pipe of its weight—enables it to handle services like those listed below with strength and service life to spare.

Go over this list and you will find that it represents the big bracket of pipe uses—the every day moderate and low pressure services that are ordinarily assigned to Standard Thickness pipe. And make no mistake about it: Going to Taylor Spiral for such applications can cut the installed cost of piping in many cases to half that of the Standard Thickness pipe it so adequately replaces.

Switching to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes, wall thicknesses and fittings. Thicknesses range from 18 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge providing a complete service with undivided responsibility.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

Do BOTH Jobs Efficiently!

SHORT HAULS ✓
LONG HAULS ✓

● With modern loading units and Bottom-Dump or Rear-Dump EUCLIDS you can move more dirt on both long and short hauls at lowest cost per yard. Using efficient digging and loading tools and Euclid equipment to haul economically is the surest way to keep costs down and profits up.

Euclids are designed for faster, easy loading under large shovels, elevating graders, draglines, transfer bins, etc. From bumper to bumper they are constructed for efficient off-the-highway service, and have proved their versatility and lower operating cost on hundreds of the toughest jobs.

If you need hauling equipment now for an essential project or are planning for future requirements, be sure to get literature and specifications on models for earth, rock, coal and ore. Your Euclid distributor will welcome an opportunity to provide information, or write us if you prefer.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH · ROCK · COAL · ORE

What's the "Life Expectancy" OF GENERAL EXCAVATORS?

Frankly, we don't know. Here's why: OF ALL THE GENERAL MACHINES EVER BUILT (over 18-year period) MORE THAN 98% ARE STILL IN SERVICE

And that isn't all! The 2% mortality includes machines unaccounted for by our records (machines we've lost track of since they left the hands of the original owners). Many of them undoubtedly are "working" and thus, *practically every General built during the past 18 years is on the job today!*

If you own a General Supercrane or Excavator, you know from experience the stamina and all-job dependability of these versatile, powerful rigs. And if you're planning now for the purchase of postwar equipment, it will pay you to get the facts on the *complete General line* including the new and revolutionary . . .

GENERAL TYPE 10

Mobile, compact combination crane-shovel-dragline
One-man, one-engine operated . . . and *on rubber!*

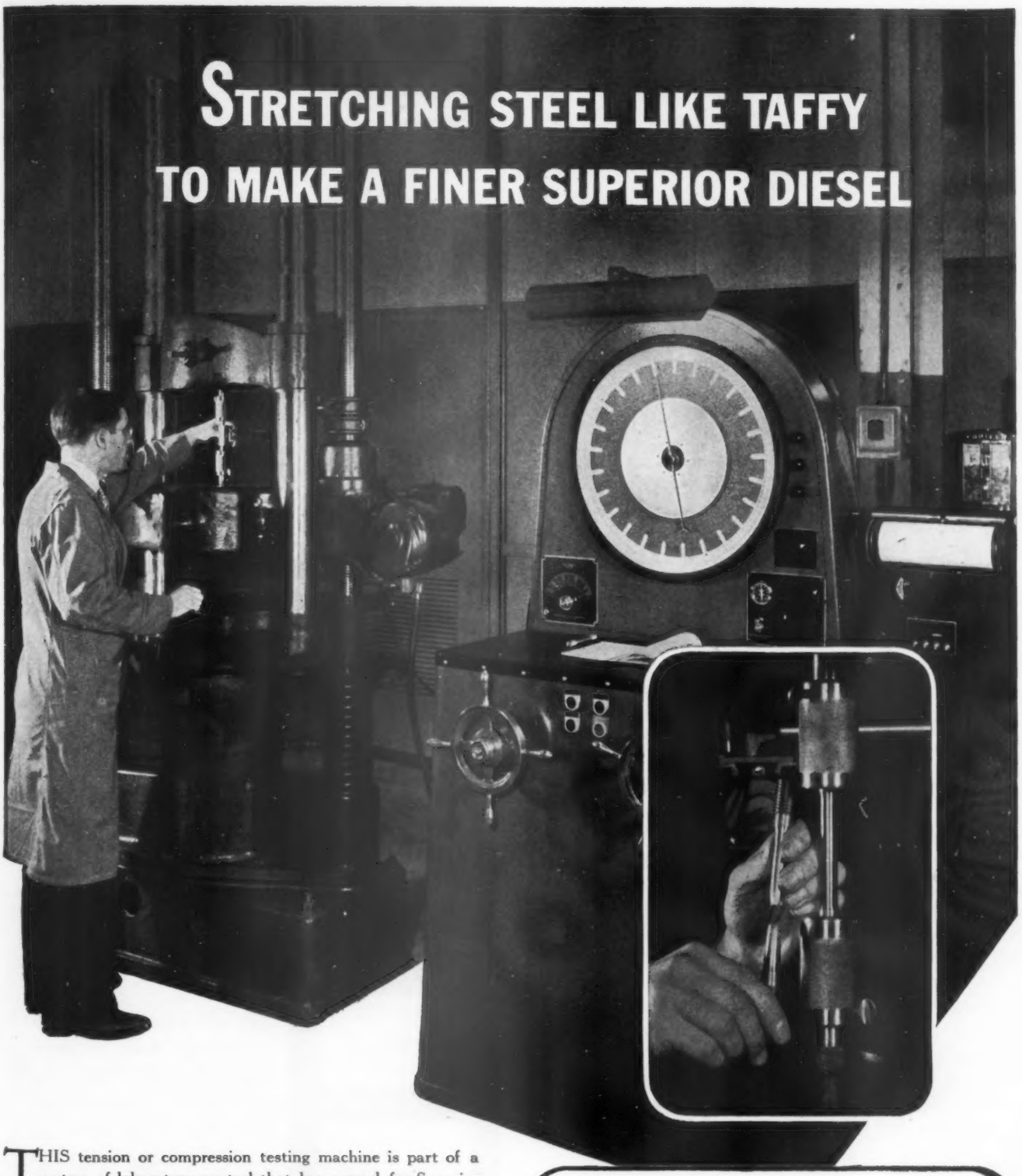
THE OSGOOD COMPANY
SHOVELS, DRAGLINES & CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company

GENERAL EXCAVATOR CO.
CRANES-SHOVELS MARION OHIO U.S.A. GENERAL OSGOOD
MARION, OHIO

GENERAL
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

STRETCHING STEEL LIKE TAFFY TO MAKE A FINER SUPERIOR DIESEL



THIS tension or compression testing machine is part of a system of laboratory control that has earned for Superior engines a reputation for excellence unsurpassed by any other Diesel. This equipment is capable of determining the breaking point of a single horse hair or a 1-inch bar of high strength alloy steel. What does this mean to you. Just this: There are no unknown factors in a Superior Diesel. Its economy, dependability and ruggedness have been proven time and again, not only in our laboratory, but in power installations all over the world.

SUPERIOR ENGINES

Division of The National Supply Co.

Executive Offices: Pittsburgh, Pa.

General Sales Office: Springfield, Ohio

Sales Offices: Ames, Iowa; Boston, Mass.; Chicago, Ill.; Detroit, Mich.; Fort Worth, Texas; Houston, Texas; Huntington, W. Va.; Jacksonville, Fla.; Los Angeles, Calif.; Philadelphia, Pa.; New York, N. Y.; St. Louis, Mo.; Seattle, Wash.; Tulsa, Okla.; Washington, D. C.

Canadian Distributors: The General Supply Co., Ltd. Ottawa ,Montreal Canada

Superior **DIESELS** • MARINE, 28 to 1325 H. P.
STATIONARY, 31 to 1325 H. P. • GENERATOR SETS, 12½ to 905 kw.

No time for absentee wire rope

In a mechanized war, fighting equipment *dares not* be absent; industrial equipment *should not.* Even though your wire rope is carrying many an extra burden, proper care will prolong its life. So . . . make sure that inexperienced operators understand its *correct* use. Gear up rope inspection. Avoid damaged sheaves and drums.

The prime way to get top rope performance is to *start* with the stamina of Preformed Yellow Strand. Install it on power shovels for hoist and swing lines, and as crowd and rack ropes . . . on dragline machines, too, for hoist and drag lines . . . and on clam shells for holding and closing lines. Preformed Yellow Strand is a quarryman's mainstay that *will stay* on the job.

Broderick & Bascom Rope Co., St. Louis
Branches: New York, Chicago, Houston, Portland, Seattle
Factories: St. Louis, Seattle, Peoria

YELLOW STRAND

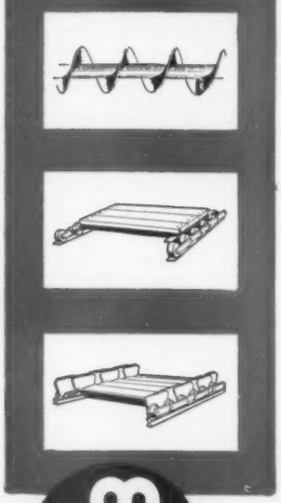
PREFORMED WIRE ROPE

For NON-STOP PRODUCTION

Rely on Jeffrey for Plans and Maintenance Parts

Keeping production moving without a break is more important now than ever. Fast-moving production lines require dependable and sturdy equipment . . . the kind that Jeffrey builds.

Jeffrey not only furnishes the right maintenance items such as idlers, chains, elevator buckets, apron and spiral flights, sprockets and transmission machinery . . . but also can supply technicians and engineers to help you coordinate your material handling requirements into a smooth-running system.



The variety of use for Jeffrey conveyors, bucket elevators, feeders, screens, crushers and vibrating equipment is almost limitless. For good parts, for rapid delivery of all kinds of material, for a well-organized handling system—think of Jeffrey first.

ESTABLISHED 1877

THE JEFFREY MANUFACTURING COMPANY
707-99 North Fourth St., Columbus 16, Ohio

Baltimore 1	Cincinnati 2	Houston 5	Pittsburgh 22
Birmingham 3	Cleveland 15	Huntington 19	St. Louis 3
Boston 16	Denver 2	Milwaukee 11	Scranton 3
Buffalo 2	Detroit 13	New York 7	Salt Lake City 1
Chicago 1	Marion	Philadelphia 3	

Any of These Problems Bothering You?

Truck Shortage –

Gas Rationing –

Tire Rationing –

Manpower –

Limited

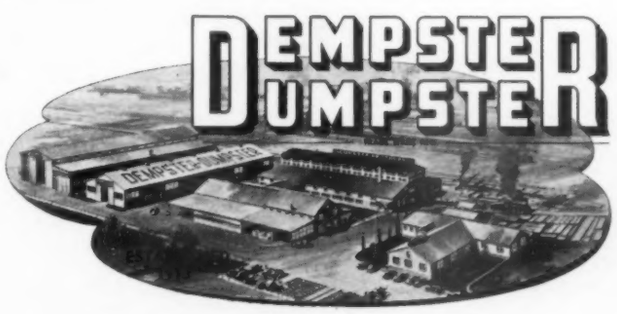
Production –

★ The Dempster-Dumpster system of materials handling has been a "life-saver," so to speak, for many quarry, cement, sand, gravel and other industrial plants during recent years. This is easily understood, once you realize the big job the Dempster-Dumpster is capable of.

To see it in operation, no stretch of the imagination is necessary to convince you at once that one truck, equipped with a Dempster-Dumpster Hoisting Unit, will do the same work of 3 to 5 of your present trucks. This one truck is on the go—giving maximum service—in a never ending cycle, hoisting, hauling and dumping one loaded body of material while any required number of other bodies are being loaded. A synchronized system of haulage that saves trucks, tires, gas, time, manpower and money.

The above illustrations show clearly how the Dempster-Dumpster system works at the loading point. No tracks to lay and move around. Empty bodies are placed exactly where they will be most conveniently loaded. No time is wasted by men or equipment.

Let our engineers assist you in simplifying haulage of material in your operation. Write for completely illustrated catalog NOW. Dempster-Brothers, Knoxville 17, Tennessee.



PIT AND QUARRY

NOVEMBER, 1944

Vol. 37 No. 5

CONTENTS

Editorial: Can Industry Pay Annual Wages? . . 62

News of the Industry 65

Washington News Letter 70

The Victory Program . . . and Your Business . . 71

62 Years Without Major Stop Is Record of Pioneer Quarry 73

Maine Lime Producer Concentrates on Agstone 76

Problems of Off-Road Haulage Units in Pits and Quarries—II 77

Carbon Dioxide a Source of Rich By-Product . 81

Trend to Portable Plants Explained 85

Now Mining Underground at Seven of Kentucky Stone's 9 Properties 87

A.I.M.E. Western Non-Metal Meeting Features Block-Caving, Flash Drying 90

Columbia Quarry Ups Capacity to Meet Huge Demand for Agstone 93

Boston Section of A.I.M.E. Stresses Production of Vital Non-Metals 95

National Gypsum Ups Rock Wool Output Despite Handicaps 97

Residential Building After the War 99

Personal Mention 104
Obituary 106
Legal Decisions 107
Traffic News Digest 110
New Machinery and Supplies 114

MEMBER AUDIT BUREAU OF CIRCULATIONS

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyrighted 1944 by Complete Service Publishing Co., 538 S. Clark Street, Chicago 5, Ill.

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

W. E. TRAUFFER
Editor

HARRY F. UTLEY
Senior Field Engineering Editor

WILLIAM M. AVERY
Field Engineering Editor

SPENCER JONES
Eastern Field Engineering Editor

BARRY JAMES
Associate Editor

W. T. KLUSSMAN
Secretary

RAY L. SMITH, JR.
Circulation Manager

●

General Manager, Field Contracts:
JAMES E. MONTGOMERY
538 South Clark Street
Chicago 5, Ill.

Eastern Manager, Field Contracts:
W. A. WILSON
Room 1235, 101 Park Ave.
New York 17, N. Y.

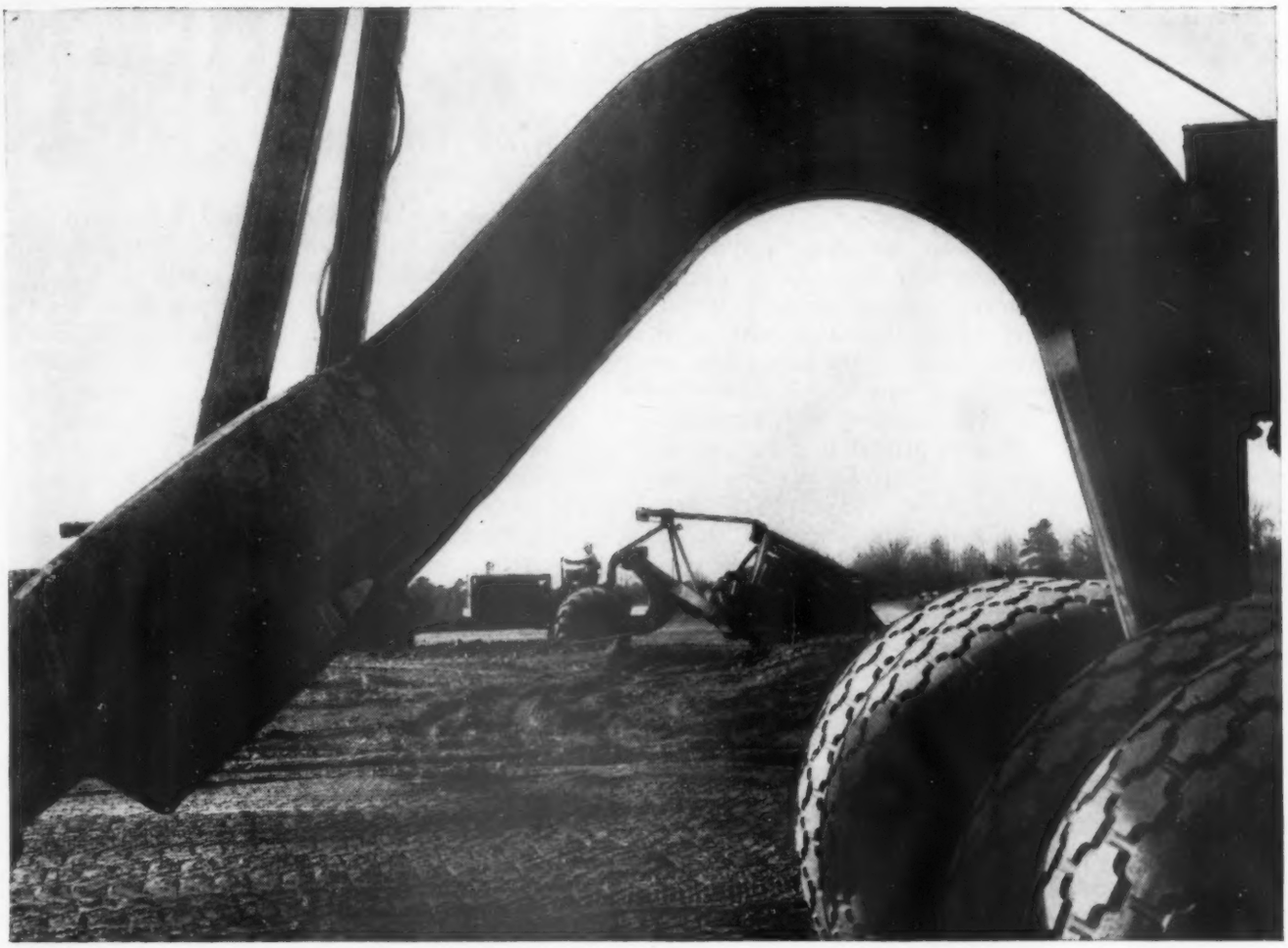
Central Manager, Field Contracts:
D. R. EGBERT
859 Leader Bldg.
Cleveland 14, O.

Western Manager, Field Contracts:
E. C. KAYE
Chicago 5, Ill.

Field Manager, Pit and Quarry Handbook:
P. K. JOHNSON
Chicago 5, Ill.

Pacific Coast Manager, Field Contracts:
WALKER & MINTON
403 West 8th Street
Los Angeles 14, Cal.

68 Post Street
San Francisco 4, Cal.



Groundwork for Air Power

BATTERIES of Tournapulls, dozers, scrapers almost overnight transform the rough terrain of invaded areas into emergency flying fields. This high-yardage dirt moving needs the rugged power of *heavy-duty* engines.

To maintain continuous, hard-hitting performance of Diesels and heavy-duty gasoline engines, contractors everywhere have found definite help through *effective* lubrication...Texaco.

Texaco Ursa Oil X★★, for example, is an additive type heavy-duty oil that is both detergent and dispersive. Its detergency keeps piston rings free and engine parts clean. Its dispersive ability holds deposit-forming materials in suspension until drained at oil change. *Ursa Oil X★★* protects alloy bearings and prevents scuffing of rings, pistons, cylinders.

For quieter-running, longer-lasting transmission and differential gears, use Texaco gear lubricants.

Texaco lubricants have proved so effective in service that they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

EDITORIAL

Can Industry Pay Annual Wages?

SINCE we last commented in these columns on the subject of an annual wage for labor the question has emerged from the field of academic discussion and is now freely talked about in the rank and file of labor. In this respect it has followed the path taken by other labor objectives and threatens to become, in our industries as in others, a definite issue in employer-employee relations. It is in harmony with the trend in labor and social legislation in that it is believed to provide a greater degree of security for workers in all fields that are normally subject to wide fluctuations in employment. There is little reason to doubt that it will become one of the principles of future labor laws among the states as well as in the area of federal legislation.

It is not difficult to understand the desires and misgivings which lead workers to favor the annual wage as a partial solution to the dangers and hardships of unemployment. The living expenses of all people constitute a pressing and recurring problem, whether they be physical or mental workers. It seems almost needless to say that the need of providing food, clothing, shelter, health and moderate recreation—to mention only the bare necessities of modern life—continues as long as life goes on. The need for some of these is uninterrupted, that for others recurs periodically or irregularly. It can not be turned on when employment exists and continues with a fair degree of stability; neither can it be turned off when employment ceases or is intermittent. Men and their families must be fed, housed and clothed even in the absence of income-providing employment, yet for the great majority of workers their income during the periods of their employment—except during the present war emergency and its relative abundance of work opportunities—has not been sufficient to enable them to set up reserves adequate to carry them through periods of unemployment.

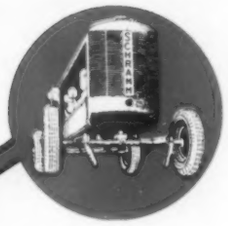
It will, of course, be alleged by some that the provision of an annual wage, even if feasible, would be socially undesirable because it would discourage thrift, pave the way for increasing absenteeism, reduce the worker's efficiency, and in other ways contribute to his moral breakdown. The same objections—expressed somewhat differently perhaps but springing from the same basic lack of understanding of the problem—were raised at the time every other social advance was first suggested. The 10-hour day, the 8-hour day, the 5-day week, the 40-hour week, and vacations with pay were met at first by the same type of opposition—the natural reaction of those who would rather dismiss a problem than struggle with it.

But there are real difficulties that stand in the way of the adoption of the annual wage in our industries and in many other industries. The principal one of these is the belief that the curve of demand and, therefore, the curve of production can not be flattened, that the peaks and valleys can not be eliminated or even softened, to an extent that would make possible the maintenance on the payroll throughout the year of a full working force. The underlying assumption here is that this leveling out is unattainable, and it is fortified by the further assumption that the annual wage could not be adopted unless such an evening of production could be accomplished.

More often than not the unevenness of the production tempo in most industries is due to an insufficiency in the demand, or an overcapacity to produce, depending upon the point of view. The insufficiency, and overcapacity, may be temporary, but it is that very temporariness that causes the wide fluctuations in employment which most industries exhibit. If the insufficiency were permanent, plants would close and the condition would soon be rectified, but the fact that demand usually revives after declining encourages the owners of all plants to keep them in operation, even if only on a greatly reduced operating schedule, in the expectation that when the revival comes, enough idle workers can be found to meet the greatly expanded needs of the moment. In many cases these fluctuations in demand are the result of natural causes, as in certain branches of the aggregates industry; in others they are due to unregulated buying habits, in yet others to style changes, in others to seasonal changes. Whatever the cause, there is good reason to believe that the wide gaps that exist in normal years between the peaks of maximum production and the valleys of minimum demand could be narrowed by intelligent study, co-operation and planning between the industries that demand and those that supply.

IN war we all expect that demand and supply should be harmonized, because of the great importance of the end involved, and we see the result attained. In peace the same harmonization could be achieved, if we could convince ourselves that the goal to be reached—the elimination of intermittent employment and the constant fear of unemployment—is just as important to the nation socially and economically as is the winning of the war. We see no good reason for believing that the same ingenuity, the same spirit of co-operation, the same agreement upon the worth-whileness of the objective that are giving us victory can not be applied with the same degree of success to freeing the country from the scourge of recurring unemployment, with its frightful waste of men, materials and money. If we really set ourselves to solving the problem presented by the demand for an annual wage, we would go a long way toward avoiding the enormous cost of an unstable economy. There is a solution, and thoughtful and conscientious study by employers, workers and public-spirited (but otherwise disinterested) persons can find it, in peace time as well as in war time.

COMPRESSED AIR...



Indispensable

to Quarrymen

Supplied by

SCHRAMM

Portable SCHRAMM Air Compressor operating heavy duty drills in limestone rock quarry.

A completely dependable and *portable* source of compressed air is a "lifeline" to the quarry operator—he couldn't get along without it.

For all-over availability under all-around working conditions, experienced crushed stone producers recommend SCHRAMM Portable Compressors.

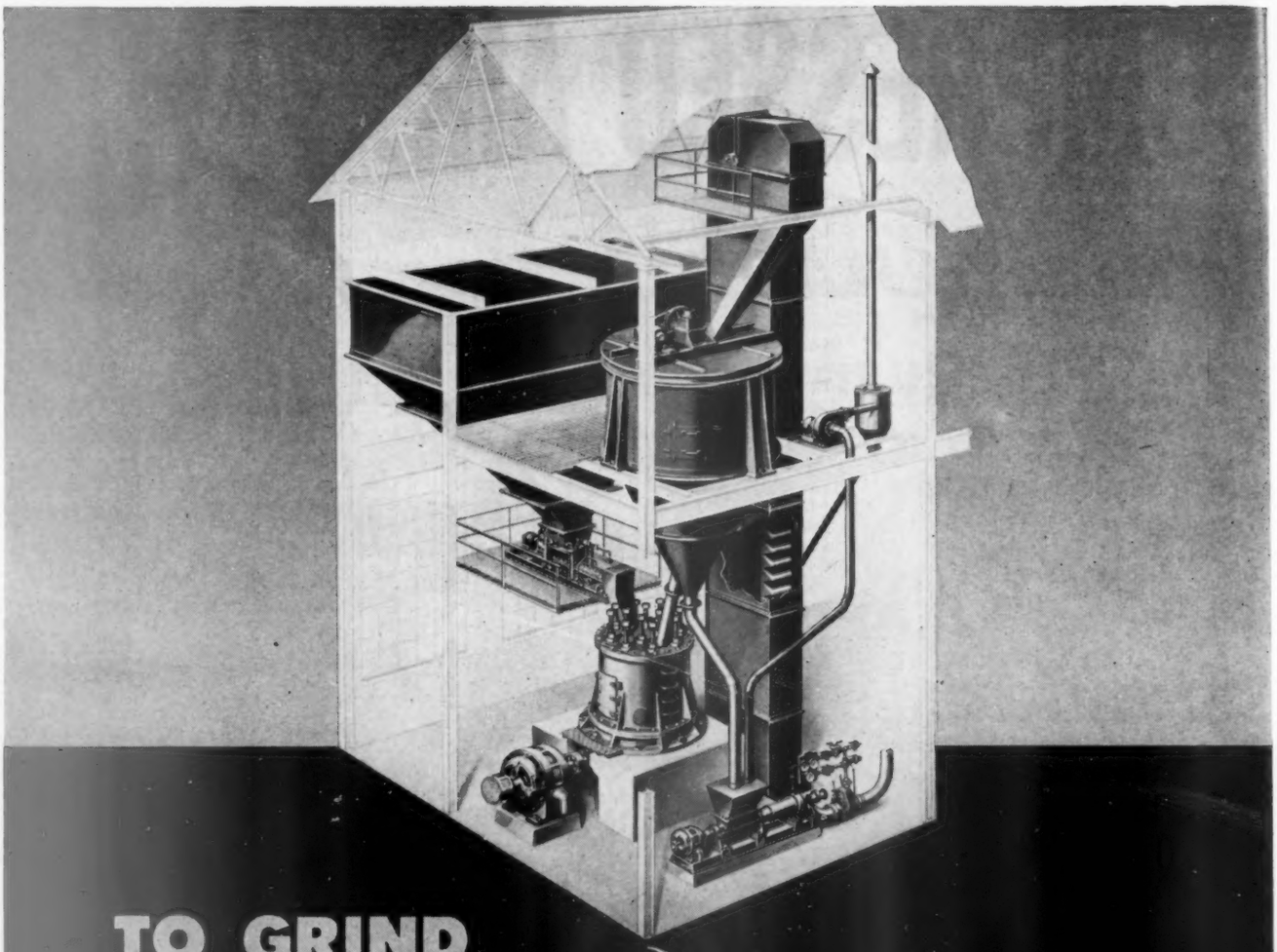
Model No. 315 shown above is a particularly rugged unit, with wide-rimmed steel wheels for rough or muddy travel.

All SCHRAMM machines provide *continuous operation* under variable loads, require least attention, and show record economies in operating and maintenance cost.

Write for Catalog Q-44

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WESTCHESTER
PENNSYLVANIA



TO GRIND AGRICULTURAL LIMESTONE Economically...

Install B&W Pulverizers

- Ball-bearing principle of grinding.
- High availability.
- Maximum overall economy.
- Integrity and responsibility of manufacturer assure satisfactory operation.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
85 LIBERTY ST., NEW YORK 6, N. Y.

PIT AND QUARRY

CHICAGO NOVEMBER, 1944

Bureau Develops Microprojector for Measuring Dust

An improved device for counting and measuring the size of dust particles by projecting their magnified images on a screen has been developed by the Bureau of Mines to assist in industrial studies of dust and its effect upon health.

Called a midget microprojector, the new apparatus is a microscope arrangement used so that greatly enlarged images of dust can be shown on a screen and be seen with both eyes, according to Dr. R. R. Sayers, Director of the Bureau of Mines. This technique eliminates the strain on the eyes and the neck caused by looking through the eyepiece of a microscope with one eye and with the head in a fixed position, Dr. Sayers pointed out.

The contrivance is described in a new Bureau publication by Carlton E. Brown, chemist in the Health Division, as a simple, compact, and inexpensive "modification of other microprojectors." It is smaller than other microprojectors developed by the Bureau and easier to use because the operator can work in the open at the microscope instead of in a booth.

The midget microprojector has other advantages over previous models in that the eyepiece is more powerful, a tungsten-arc lamp which radiates a steady light is used instead of a carbon-arc which made the replacement of electrodes necessary every few hours, and a mirror in the projection path makes it possible for the entire device to be drawn closely together and enables the user to operate the microscope directly rather than through remote controls.

Time and labor are saved by using the midget microprojector, Brown states. The Bureau of Mines analyzes thousands of dust samples annually from coal mines and industrial plants.

Research Institute for South Is Formed

The recent extension of its operations to serve a larger area of the south, has brought about the reorganization of the Alabama Research Institute. It will be known as the Southern Research Institute, its main purpose will be technical research on a contract basis. The scope of its activity has been patterned largely after the Mellon Institute. At present a foundation fund of $400,000 has been subscribed by business firms and individuals of the south, which before long is expected to reach $1,000,000. Among the officers of the new institute are Wallace L. Caldwell, president of the Alabama Asphaltic Limestone Company, Birmingham, who is vice chairman, and Robert Gregg, president of Tennessee Coal, Iron and Railroad Company, a trustee, also of Birmingham.

Coming Events

November 15-16, 1944 — Pittsburgh. Industrial Hygiene Foundation, Mellon Institute.

Nov. 27-Dec. 2, 1944 — New York. 16th National Exposition of Power and Mechanical Engineering, Madison Square Garden.

December 5, 1944 — Oklahoma City. Annual Meeting, Oklahoma Mineral Industries Conference, Oklahoma Club.

January 23-25, 1945—New York. 29th annual convention, National Sand and Gravel Association, Hotel New Yorker.

January 24-26, 1945—New York. 15th annual convention, National Ready Mixed Concrete Association, Hotel New Yorker.

January 29-31, 1945—New York. 28th annual convention, National Crushed Stone Association, Hotel New Yorker.

January 21-24, 1945—Chicago. 26th annual meeting, Associated Equipment Distributors, Edgewater Beach Hotel.

February 7-9, 1945 — Chicago. Annual Meeting, National Concrete Masonry Association, Hotel Sherman.

New Standards Set by American Society for Engineering Groups

Many new specifications and tests for engineering materials and important changes in existing standards were approved on August 28 by the American Society for Testing Materials acting through its committee on standards procedure. Recommendations on new standards coming from the society's standing technical groups have been under development for some time, many for a year or more. The materials involved include cement and soil-cement mixtures.

Although the existing standard for masonry cement, C 91, is being continued, new tentative specifications also are to be published with important changes. These include an increase in the flow of 100 to 115 per cent. instead of the present requirement 65 to 80 per cent. Compressive-strength requirements have been raised to the present value 400 and 750 psi. respectively for the 7-day and 28-day strength requirements compared with the values in the standard of 350 to 600 psi. and because in the production of good brick work a mortar possessing high water retentivity is considered desirable, this requirement is now to be greater than 70 per cent. instead of the current value of 65 per cent.

A new Test for Determining Cement Content of Soil-Cement Mixtures, D 806, was developed jointly by Committees D-4 on Road and Paving Materials and D-18 on Soils for Engineering Purposes. The method covers determination of the cement content of mixtures that have been sampled from a project under construction or after completion, determination being made chemically. Increasing use of these methods of construction make this new test method pertinent.

Damage to Eastern Plant from Floods Amounts to $50,000

Damage exceeding $50,000 was sustained at the plant of the Alberene Stone Corporation at Schuyler, Virginia, during the recent cloudburst and floods.

In describing the damage done Major John S. Graves, president, said: "In this whole section we have conditions similar to those in October, 1942. The Rockfish River washed most of the bridges away and the water went into our power house. Everything was flooded and some of the instruments damaged." A large two-story office building erected in 1936 was torn loose from the mill building and floated down the railroad track several hundred feet. Thousands of feet of lumber are washed away. Motors were drowned out and the carpenter shop and machine shop under water. He estimated the plant could be put back in operation "within a reasonable time." The 350 employes are now at work cleaning away *debris*.

Making Cement for Lining Adams Tunnel

Maufacture of 110,000 barrels cement for lining the Adams tunnel of the Colorado-Big Thompson diversion project, is well under way at the Colorado Portland Cement Company's plant north of Laporte. Some delay in the delivery of the cement, scheduled to start early in September, was caused by shortage of labor in preparing the tunnel for lining. Plans now call for spreading the production of the cement over about a year, although 110,000 barrels represent only about a month's work; in this way the cement can be supplied to the tunnel as needed. It is believed that the lining task will be completed in time to start irrigation water through the tunnel for 1945 crops.

Atlas Names New Sales Manager for N. Y. Office

Universal Atlas Cement Company recently announced the appointments of Edward J. Head, Assistant Sales Manager, as Sales Manager in New York; and Foster A. Hagan as Assistant Sales Manager, New York.

Early in the huge program of defense construction for the present war Mr. Head went to Washington, D. C., to coordinate the Universal Atlas sales activities there. In 1941 he went to British Guiana as coordinator and Assistant Project Manager for The Elmhurst Constructing Company in the construction of the army base at Georgetown, rejoining Universal Atlas a year later as Assistant Sales Manager in New York. He now takes charge of sales in that territory. Mr. Hagan born in New York City has lived there since. From 1918 to 1924 he was in the stevedoring and warehouse business associated with Carroll, Hagan and Carroll. In 1924 he was a salesman for the Lehigh Portland Cement Company, coming to Universal Atlas in 1942. He has since been special representative in metropolitan New York.

Dynamite Charge As It Was Set Off at River Products Quarry

This picture was taken at the moment a 2,750 pound charge of dynamite was set off at the quarry of the River Products Company, Iowa City, Iowa. A 9,000-ton mass of limestone was brought down, covering an area, indicated by dotted lines, 100 feet wide, 71 feet deep and 16 feet thick. Eight days were required to set the charge, several holes 71 feet deep being drilled for the dynamite. Using the "deck loading" method, the charge was set off by the use of Primacord.

Idaho Area Reports Better Mica Output

The Colonial Mica Corporation, Moscow, Idaho, through its district manager David Keppel, reports increased output from the Idaho area. This company acts as agents for the Metals Reserve Company in the purchase of mica, operating in four districts of North Carolina, New Hampshire, South Dakota and Idaho. In the last named state, over 200 persons from Latah County, the mica center, are employed in the production of this mineral.

B. F. Lease has been named vice-president of Athey Truss Wheel Company of Chicago. He will have charge of sales, advertising and service.

College to Use Stone from Own Quarry to Erect New Residence

Mount Allison University, Sackville, New Brunswick, is believed to be the only college owning stone quarries. Stone from these quarries is to be used in the erection of a new residence at the college. This replaces a large building destroyed by fire several years ago. The new building is in three units and $100,000 is now available for its construction.

The Arkansas Agstone Company, Batesville, recently filed articles of incorporation in Little Rock. Authorized capital stock was listed at 100 shares at $100 each. The company will engage in buying, selling and manufacturing limestone products. Incorporators were Harvey G. Combs, Leffel Gentry and John F. Park, all of Little Rock.

Frank P. D'Aquqila, lecturer-author on Latin American relations, has been appointed export sales manager of the Iowa Manufacturing Company, Cedar Rapids, Iowa.

Virginia Legislature Studies State-Owned Lime Plant Problem

Feasibility of establishing state lime-grinding plants in Kent, Grayson and Russell counties of Virginia is the subject of one of 17 interim studies being undertaken by the Virginia Advisory Legislative Council, which at a meeting Sept. 25 named Senator Edward L. Breeden Jr. as chairman and assigned topics.

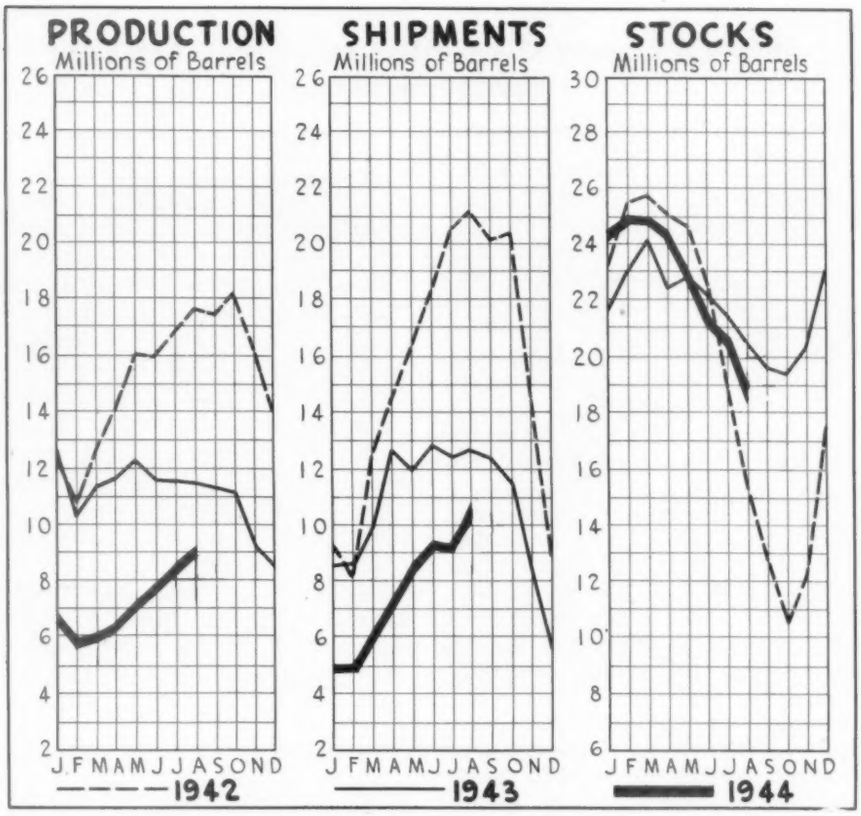
The lime-grinding plants study was assigned to Senator Robert C. Vaden of Gretna. The members of the subcommittee to conduct the study with him had not been announced at this writing. This and the other studies, which were directed by the 1944 Virginia Legislature, was ordered for completion prior to the next regular state legislative session in 1946.

Fairbanks-Morse Buys Joshua Hendy Company

In a $4,000,000 transaction Fairbanks, Morse and Company, Chicago, has acquired all physical assets, patents and trade-marks of the Pomona Pump Company, a division of Joshua Hendy Iron Works. Announcements of the sale were made simultaneously in Chicago by R. H. Morse, Jr., general sales manager of the purchasing company, and in Sunnyvale, California, by Charles E. Moore, president of the Hendy company. The sale, effective as of September 2, does not involve any changes in personnel. Arnold G. Brown, general sales manager of the Pomona company, becomes assistant manager of the Fairbanks - Morse pump division, with distribution and sales of Pomona and Westco products under his direction.

Company Spends $50,000 for Agstone Equipment

A complete crusher and rolling mill for production of agricultural limestone, flour and pulp stone, are being installed by the McMillan Mining and Quarry Company, of Roche Harbor, Washington. Property in the deal was purchased from Walter S. Planta, pioneer promoter in Texada Island quarrying, and involved several thousands of dollars. More than $50,000 will be expended on a wharf, equipment and installation of machinery; and as operations expand 100 men are expected to be employed.



The Portland cement industry in August, 1944, produced 9,003,000 barrels of cement, shipped 10,758,000 barrels and had in stock at the end of the month 18,478,000 barrels, according to the Bureau of Mines. Compared with August, 1943, production was down 34 per cent., shipments were 15 per cent. lower, and stocks on hand were 9 per cent. below those of July 31. Another indication of the improved position of the industry was the gain in production during August over July 1944, which was larger proportionally than the usual seasonal gain between these months.

U. S. Rubber Acquires L. H. Gilmer Company

United States Rubber Company has agreed to purchase the assets and business of the L. H. Gilmer Company of Philadelphia, manufacturers of industrial V-Belts, it was announced today by Herbert E. Smith, president of the rubber company.

Founded in 1907 and employing approximately 600 people, Gilmer lists among its chief articles of manufacture besides V-Belts such products as automobile fan belts, rubber covered rolls and industrial truck wheels and other related items. A major part of the company's current production is for the war effort.

Mr. Smith said that the purchase was made to round out further the mechanical goods division of the rubber company. He added that no change in the management or operations of the Gilmer Company is contemplated. John S. Krauss, president, will continue in the active management of this business.

John M. Settle, 75, Passes Away at Louisville, Ky.

John M. Settle

John M. Settle, 75, president of the Ohio River Sand Company, Louisville, Kentucky, passed away recently. A native of Louisville, Mr. Settle was one of the organizers of the company, formed January 1, 1891. Until December, 1931, he was executive secretary, when he became president. He is survived by his wife, daughter, son and a sister and brother.

Russ A. Loveland has been appointed production manager of Cementos Anahuac, S. A., whose plant is located about 10 kilometers southeast of Cuernavaca, State of Morelos, Mexico. Mr. Loveland, was formerly chief chemist of the Dewey Portland Cement Company's plant at Dewey, Oklahoma.

Safety Measures Given Stimulus at Well Attended Annual Meeting

With general chairman Johan Norvig, of the Penn-Dixie Cement Corporation, presiding, the Cement and Quarry Section of the National Safety Council met at the 33rd National Safety Congress, Morrison Hotel, Chicago, October 3 and 4. That war-time operations have given definite stimulus to interest in safety was well demonstrated by the large attendance at the two-day meeting, and the close attention accorded the speakers.

The tightly-scheduled meeting heard addresses by Merrill C. M. Pollard, safety director of the National Gypsum Company; Edward Fitzgerald, safety director of the Marquette Cement Manufacturing Company; J. A. Lehaney, vice-president of the Lone Star Cement Corporation; M. M. Bowman, eye-safety consultant, U. S. Department of Labor; Ralph W. Merrill, safety engineer of the Portland Cement Association; and R. A. Bechtold of the Pennsylvania-Dixie Cement Corporation.

The report of W. W. Adams, supervising statistician, U. S. Bureau of Mines, covering accidents in the cement and quarrying industries for 1943, was read to the meeting. Mr. Adams' report revealed the following:

Cement.—The number of men employed in 1943 was 25,811, which was 15 per cent. less than the number in 1942 and a 23-per cent. increase over that of 1933. The number of man-hours decreased 16 per cent. below that of 1942, but was more than double the figure for 1933. The accident-frequency rate was 13.34, an increase over the rate of 11.72 in 1942, also over the 1933 rate of 11.69. The 1943 rate was the highest accident-frequency rate in the 11-year period 1933-43 with the exception of 1936.

Limestone.—The limestone industry (including plants producing limestone for the manufacture of cement and lime) employed 21,742 men for 45,045,057 man-hours in 1943. This was a decrease of 18 per cent. in the number of men employed and 13 per cent. in the number of man-hours of work compared with the figures for 1942. The accident-frequency rate was 43.62 in 1943 and 49.56 in 1942. The 1943 rate is the lowest recorded for the limestone industry during the 11 years 1933-43.

Limestone (chief product, lime).—This group includes limestone plants whose product is used chiefly for the manufacture of lime. It showed the smallest decline in employment in 1943 of the entire quarrying industry. The men employed numbered 10,186, only 4 per cent. less than in 1942. These men worked over 25,000,000 man-hours, a decrease of less than 1 per cent. when compared with the record of 1942. The preliminary accident-frequency rate was 50.88 compared with 52.82 in 1942. The high point in accident-frequency since 1935, when separate figures for the lime industry were first segregated from those for limestone in general, was reached in 1941, when the rate was 61.97.

Sandstone.—The sandstone industry also suffered a decline in employment in 1943. The number of men employed (2,441) declined 14 per cent. and the number of man-hours (4,892,968) 9 per cent., when compared with the figures of the previous year. Employment, however, was not the lowest in the 11-year period, as it exceeded both the 1933 and 1934 records. The accident-frequency rate declined, from 59.68 in 1942 to 57.63 in 1943, although more favorable than the rate of 68.63 in 1933.

Trap Rock.—The number of men employed (2,256) decreased 28 per cent. in 1943 compared with the 1942 figure, thus making 1943 employment less than that in any other year since 1933. The decrease in man-hours was not as great, being 23 per cent. The 1943 accident-frequency rate was practically the same as the 1942 rate, being 59.91 and 60.32, respectively. These rates compare very favorably with the earlier years in the period under discussion.

The meeting elected the following officers to serve the Cement and Quarry Section for the forthcoming year. Johan Norvig, general chairman; F. J. Buffington and W. V. Brumbaugh, vice-chairmen; J. R. Boyd, secretary; W. E. Tippin, editor of the *News Letter;* H. A. Reichenbach, engineering chairman; F. R. Cadman, membership chairman; S. T. Greenawalt, program chairman; and W. W. Adams, statistician.

Merit Award Given Generoso Pope First to an Italo-American

In recognition of his performance in the construction of the United States Naval Ammunition Depot at Earle, New Jersey, the Navy recently awarded to Generoso Pope, president of the Colonial Sand and Stone Company, the Meritorious Civilian Service Emblem.

Commander Rockwell pinning award on Gene Pope.

The award, the first of its kind to be conferred on an Italo-American, was given for service over and beyond those normally required. The presentation was made in the presence of prominent personalities in naval, military and administration circles, by Commander D. E. Rockwell, in charge of construction at the depot.

In speaking of Mr. Pope's contribution, Lieutenant Commander Spellman, executive officer, said: "There were many things a contractor had to fight at this ammunition depot, among which were hurricanes, deluges of water, cold, old equipment, and seas of mud. To fight a winning battle took imagination, courage, a will to win and the ability to surmount all obstacles. During the past year the firm of which this man is the guiding genius, has furnished this station over 250,000 cubic yards of concrete; over 500,000 cubic yards of cinders, 250,000 of stone and miscellaneous material. This tremendous demand has required a fleet of about 200 trucks to deliver this material; in many cases the conditions where it was to be placed were impossible—yet it was done."

In accepting the award, Mr. Pope said: "The work that has been accomplished was made possible by the splendid cooperation of all the men working here. Without their wonderful contribution it would not have been possible. On behalf, then, of all these people, I want to thank the Board of Awards for this honor."

World's Longest Conveyor Dismantled by Kaiser Co.

After four years of operation by Kaiser's Columbia Construction Company, during which it carried 12,000,000 tons of sand and rock more than nine miles to the Shasta Dam, the world's longest belt-conveyor system is being dismantled.

Since March, 1940, the conveyor has transported sand, rock and gravel for mixing 6,000,000 cubic yards of concrete for the dam, second largest in the world. The conveyor contained 26 separate sections, each motivated by a 200-horsepower motor, and had a speed of 550 feet per minute. This conveyor system and its operation were fully described in the November 1939 issue of PIT AND QUARRY.

● Corrections

Although the news story in the October issue of PIT AND QUARRY was correct in stating that a new corporation had been formed by E. J. Krause and H. C. Krause of the Columbia Quarry Company, St. Louis, to purchase and operate a portion of the Gulf, Mobile & Ohio Railroad, the heading above the article was erroneous when it said that the quarry company would operate the road. The new company was incorporated in Springfield, Illinois, not Missouri.

The article "Dust Collectors Pay Dividends at Orange Quarry Company," in the September issue of PIT AND QUARRY, stated that the stone was sized on a 6- by 20-foot 3-deck Symons vibrating screen. The Nordberg Manufacturing Company of Milwaukee advises us that they do not produce a screen of that size, but a 4- by 16-foot double deck vibrating screen.

The Windsor Plaster Company, Windsor, N. S., extended a special invitation to residents of Nova Scotia outside Windsor to attend the 1944 edition of the Windsor fair, one of the oldest fall fairs in the world, *viz* over 150 years. The visitors were invited to visit the company's quarry and plant while in Windsor.

The U. S. Bureau of Mines is preparing to core drill the Daisy fluorspar mine near Beatty, operated by J. Irving Crowell. The property is equipped with a small flotation and gravity concentration plant and has been Nevada's foremost fluorspar producer for several years.

Women Help Labor Shortage of Iowa Firm by Hauling Limestone

Women are doing their part in helping out during the busy days at the River Products Company plant, Iowa City, Iowa. Their job is hauling agricultural limestone to the farms. Mrs. Vernon Kent, left, is waiting her turn to take on a 11,000 pound load. The mother of two sons, both in the service, and a daughter, she has been hauling for seven weeks. The lady shown greasing the box of her truck as she waits her turn for loading at the crusher, is Mrs. Roy Strong. Hauling limestone is pretty much routine for her; in another month she will have completed her second year as a truck driver. The only thing that daunts her is when she has a flat tire. "Changing a tire on one of these trucks is a little too much for me," she admitted.

Bureau of Mines to Drill Black Canyon Fluorspar Property

Extensive exploratory drilling at the Valery fluorspar property in Black Canyon, Lovelock, Nevada, will be undertaken soon by United States Bureau of Mines. A geological survey of the deposit has been completed, and it is understood the Bureau will receive funds for the project from an appropriation recently authorized by Congress.

The tentative program is reported to include comprehensive development work and erection of a centrally located concentrating plant. Promising deposits of acid spar, source of hydrofluoric acid which is used in improved production of high octane gasoline, are said to have been opened below a heavy limestone capping in the Valery.

R. T. Hamilton of Lovelock announced early this year that he had transferred the property to Cooper Shapley, engineer for Allied Chemical & Dye Company of New York. It was later reported the Valery was to be developed by General Chemical Company. It was inspected several months ago by Major R. B. Silverman of the St. Louis ordnance district, War Department.

Powhatan Mining Co. Now Shipping Asbestos

The Powhatan Mining Company, Dunsmuir, California, is shipping asbestos from Dunsmuir. The product is received from small deposits worked in the Dunsmuir and adjacent districts. Following inspection of asbestos deposits in Alaska, the company is understood to have arranged to purchase a substantial amount of the product for shipment.

Some absestos is being shipped to Powhatan Mining Company by Gold Meadows Mining & Milling Company from a deposit on the Bowman property six miles west of Forest Hill. The product is long fiber and said to be of high quality.

another P Q exclusive

AT THE time of this writing, the election has not yet been held, and the big news of the month from the national capital is therefore still unwritten. It has become a commonplace in years past to speak of each succeeding presidential election as the most important in our nation's history. The events leading up to and surrounding this particular election, however, make it clear that its significance extends far beyond our own national boundaries. It is impossible to face squarely the issues involved without appreciating the importance of this election to the hopes of the rest of the world.

We are in the midst of the most destructive war the people of the world have ever known, a war resulting from a complex of political, economic, and social forces. Looking back upon the twenty-five years which followed the last "war to end all wars," hindsight illuminates the lack of vision and foresight which led to the present holocaust: The failure to recognize the interdependence of the peoples of the world and to participate wholeheartedly in the solution of world problems; the failure to recognize the welfare of other nations as vital to our own, and the concomitant failure to evolve a cooperative approach to world prosperity; the failure to recognize that national hoodlumism, if unarrested, can develop into an international crime wave, with domination of the world its ultimate ambition; the failure to recognize the basic truth that anti-democratic forces anywhere in the world imperil democratic principles everywhere. The essential result of these and other fundamental errors was to make the world ripe for the most virulent disease ever to infect mankind—the plague of fascism, with its perverted scale of values, its cultural poverty, its philosophy of arrogance, brutality and intolerance, and its rationalization of man's inhumanity toward his brother. The failure to exterminate this virus in its early stages culminated finally and inevitably in a second and greater conflict to make the world safe for democracy.

Early in the 1944 presidential campaign international policy became the dominant issue to be decided at the polls. This is as it should be. Fortunately for the American people, this war has been fought comfortably distant from our shores. Nevertheless, the universal suffering and sacrifice, accentuated by mounting casualty lists, have had a sobering effect upon Americans, as upon human beings everywhere, and have emphasized the need for avoiding the errors of the past.

To observers in Washington, and to thinking people throughout the country, the issue of how to organize the peace transcends all others. To the discerning voter, the issue is fairly clear cut, both candidates having had ample time and opportunity to indicate by acts and statements their respective grasp of profound international problems, the clarity of their understanding, and their ability to lead the American people in matters of the greatest moment to their welfare.

Although the election has not at all affected military operation, it has to some extent caused a lull in domestic developments. Mr. Roosevelt has announced that Justice Byrnes will serve as the director of the new Office of War Mobilization and Reconversion until shortly after the election, at which time a permanent appointment will be made. Mr. Byrnes had already announced his intention to retire, and since the reconversion activities of the federal government are to be co-ordinated through this agency, the business of organizing to carry the weighty responsibilities assigned to it has necessarily been postponed several weeks. Under present, more realistic, estimates of the tenacity of the German war machine fighting on its home ground, and the length of time organized resistance may be expected to continue, the postponement of the work of the O.W.M.R. is not as serious as it might otherwise be. This is particularly true in view of the valuable work which has been done by the War Production Board in recent weeks in evolving more specific plans for the removal or drastic modification of controls after V-E Day. Several complexities still remain, but these are being ironed out by a battery of "task committees" appointed by Mr. Krug.

The resolution of the wage-stabilization question has also been deferred until after election, although there is little doubt that the President will authorize an upward revision of the "little steel" formula to compensate more adequately for rises in the cost of living. It is a safe bet that this authorization will be granted before the end of November. Finally, concerted efforts will undoubtedly be made in the Congress to liberalize the reconversion legislation passed just before the Congressional recess. With the Congress having already adjourned by the time the legislation reached the White House for signature, the President had only the unsatisfactory "take it or leave it" choice, and Mr. Roosevelt, in signing, made no attempt to conceal his disapproval of many of the provisions. One of the very first items of business taken up before the reconvening Congress will therefore be the changes and additions still needed to make reconversion successful.

Nordberg Subsidiary to Go In for Plant Design

The Nordberg Manufacturing Company has acquired the controlling interest in the Northern Processing Machinery Company of Cleveland, Ohio, a firm of specialty engineers which was recently organized to engage in the design and manufacture of basic-materials processing machinery and plants. This new company will operate hereafter as a subsidiary of the Nordberg Manufacturing Company under the corporate name of the Nordberg Process Machinery Company.

The Nordberg line of mining, crushing, and screening machinery will be augmented to include many additional types of processing machinery as used by crushed-stone, sand-and-gravel plants; milling, calcining, sintering and smelting plants; alkali and heavy industrial chemicals industries; and clay, bauxite, alumina, lime, cement, gypsum, chalk, pigment and granule plants.

R. R. Shafter, one of the founders of the Northern Processing Machinery Company, will continue as vice-president and general manager of the new Nordberg subsidiary, with headquarters in the Lincoln Building at 60 East 42nd Street, New York. Mr. Shafter brings to Nordberg a background of more than thirty-five years experience in this specialty field. Manufacturing will be centered in Nordberg's Milwaukee works.

the VICTORY *Program*

. . . . . AND YOUR BUSINESS

CONSTRUCTION MACHINERY ORDER AMENDED.—Limitation Order L-192, dealing with construction machinery and equipment, has been amended as of September 28, 1944. The entire order (PIT AND QUARRY, April, 1944, pages 60 to 62) will not be reprinted here but only those portions that reveal important changes, which will be indicated by underscoring.

BINS FOR CEMENT. — On September 27, 1944, the War Production Board addressed the following letter to V. P. Ahearn, executive secretary of the National Ready Mixed Concrete Association in Washington, D. C.

As you know in the interest of conservation of transportation the several governmental agencies have encouraged or made mandatory the loading of railroad cars to full capacity. We have received numerous requests to investigate bin capacities for bulk cement, especially at ready-mixed-concrete plants, for purposes of granting special permits.

In the past year and half we have known of a number of companies who have installed bin equipment for bulk cement rather than handle sack cement. However, a large number of companies have not provided for and do not have adequate bin capacity to receive full-capacity hopper-bottom cars of bulk cement, nor do they seem to have provided for any reasonable surplus capacity to unload a full-capacity car when such is received before all the cement can be removed from the bins.

While the thought is still fresh in mind we considered it advisable to bring to your attention that at some appropriate time you might consider it advisable to call this to the attention of the members of your association to provide for adequate bin capacity as soon as restrictions on steel are released in order that they will be able to meet peak and fluctuating demands that we feel certain will develop as a post-war construction program gets under way.

In developing plans for post-war plant reconstruction it night be especially desirable for the companies to include bin design consistent with car capacities. This could save excessive demurrage charges and delays in receipt of cement in many areas of concentrated demand.

Very truly yours
CARL F. CLAUSEN
Chief, Non-Metallics Section
Building Materials Division
WPB Department 7820

Schedule A Equipment

(c) *Procedure for placing and receiving orders for Schedule A equipment.* (1) No person shall sell or deliver any new equipment listed in Schedule A, except to a war agency, unless the purchase or delivery order is accompanied by authorization on Form WPB-1319 or by a certification as explained below. Application for such authorization and for a preference rating must be made by filing the required number of copies of Form WPB-1319 with the War Production Board regional office in the region in which the purchaser desires to use such equipment, in accordance with the current instructions for the form. When a person receives authorization on Form WPB-1319 to purchase Schedule A equipment, he may give his supplier the authorization along with his purchase order, or if he prefers, he may give the supplier a certification in substantially the following form: "Authorized under Order L-192—on Form WPB-1319, Case No....." This certification shall constitute a representation to the War Production Board that the purchase or delivery of the Schedule A equipment ordered has been specifically authorized by the War Production Board on Form WPB-1319. . . .

(g) *Restrictions on resale, rental and use.* Every person, except a war agency, to whom delivery of any new equipment listed in Schedule A has been authorized pursuant to this order, must use such equipment on the project described in the authorization to purchase. Here in addition, every person except a war agency, thirty days prior to the sale, lease or use on any other project of such equipment, shall notify in writing the Used Construction Machinery Regional Specialist of the War Production Board Regional Office in the region in which the equipment is located. The War Production Board at any time on two weeks' written notice, may require any such person who owns such equipment to sell, lease, or use such equipment as directed.

Schedule D Equipment

(p) *Restrictions on production of Schedule D equipment.* Producers must not use or put into process any materials for the production or assembly of any equipment listed in Schedule D.

SCHEDULE A

Crushers, jaw (sizes 9" x 14" to 30" x 44" openings, inclusive); except those sizes of a type designed exclusively for mining and smelting.

Crushers, roll, construction aggregates, portable type.

Dredges and dredge equipment, except mining.

Mixers, concrete construction, above 7 cubic feet.

Mixers, concrete truck or agitator type (with or without elevating towers).

Pumps, portable engine or electric-motor-driven pumping units mounted on skids with or without handles, or trailer mounted larger than 90,000 gallons per hour, self priming centrifugal pumps, horizontal or vertical triplex piston rod pumps, ordinarily used for contractor's purposes or by contractors for dewatering and supply.

Sweepers, motor pick-up, traction driven or engine driven.

SCHEDULE B

Brooms, rotary, tractor or truck mounted.

Mixers, concrete construction, 7 cubic feet and smaller.

Pumps, portable engine or electric motor driven pumping units, mounted on skids with or without handles, or trailer mounted 90,000 gallons per hour and smaller self-priming centrifugal pumps, plunger pumps, or diaphragm pumps ordinarily used for contractors purposes or by contractors for dewatering and supply, excluding farm type, industrial type and underwriters approved fire fighting pumps.

CONSTRUCTION ORDER AMENDED.—The War Production Board's Conservation Order L-41 has again been amended. The construction of structures used directly in the discovery, development or depletion of mineral deposits is exempted from the requirement for W. P. B. permit under L-41, but new construction in all industries other than those operating mineral deposits must first be approved by the W. P. B., even though preference ratings are available to such industries for the procurement of the necessary equipment for the new construction.

As the entire order has previously appeared in these pages (PIT AND QUARRY, December, 1943, pages 49 to 51; amendment PIT AND QUARRY, June, 1944, page 54), only the important altered portions will be given in what follows, the changes being indicated by underscoring.

(c) *How much construction is allowed without getting permission.*

(2) $1,000 for a farm including the farm houses. However, not more than $200 of this sum may be spent on any farm house on the farm. A "farm" means a place used primarily for raising crops, livestock, dairy products, poultry, etc., for the market. A "farm house" means a building on a farm used for residential purposes.

(11) $1,000 for a building or group of buildings which will be used directly for a sewage system and owned by a sewage system operator as defined in Order P-141.

(d) *Special kinds of construction which do not require permission.*

(7) Insulating existing buildings with materials such as storm windows and doors, pipe covering, loose fill, blanket or bat insulation, plain or granule surfaced rigid insulation and weather stripping. . . . The cost of new insulating materials used in building a new building or in making alterations to or converting to a new purpose an old building must be included in the cost of the job.) Also any installation of heating and combustion equipment resulting in a saving of the fuel formerly used (not including a change to a new kind of fuel) where the total cost of the installation including the cost of the equipment does not exceed $25,000 and where the cost of installation excluding the cost of the equipment does not exceed $5,000. Also the installation of conversion units designed for burning gas in a furnace or boiler formerly burning coal where the use of the fuel involved is not restricted for that purpose by Order U-7 or Order L-174 or where permission has been obtained for the use of the fuel from the War Production Board, Office of War Utilities.

(9) Grading, ditch-digging or similar earth-moving operations, if no cement, lumber or other building materials are used, except clay tile and non-reinforced concrete pipe. This applies only to projects which can be completed without the use of any other materials. It does not apply to earth-moving operations which are part of a construction job in which other materials will be incorporated before completion.

(i) *How to figure cost.* (1) For the purpose of determining whether a construction job may be started without getting permission from the War Production Board, "cost" means the cost of the whole construction job as estimated at the time of beginning construction, including the cost of all paid labor, regardless of who pays for it, and including the cost or value of new machinery, equipment, fixtures and materials incorporated in the construction (whether or not obtained without paying for them), but excluding the cost or value of previously used machinery, equipment, fixtures, and materials, the value of unpaid labor, and architects' and engineers' fees (contractors' fees must be included).

(2) Deleted September 28, 1944.

(4) Deleted September 28, 1944.

GASOLINE RATIONING. — The Office of Price Administration on October 12 broadened its gasoline-rationing program to include a number of functions that heretofore have been handled by the Office of Defense Transportation.

Procedures under the transfer are formalized in General Order ODT 21A, which supersedes General Order ODT 21 as amended, and in Amendment 1 to ODT Administrative Order No. 8, Amendment 2 to ODT Administrative Order No. 15, and in Amendment 156 to OPA Ration Order 5 C—Gasoline, all effective October 16.

All operators of commercial motor vehicles that require certificates of war necessity—such as buses, trucks, taxicabs, rental cars, etc.—will be affected by the change, the O.P.A. and the O.D.T. announced.

Under the new procedure applications by commercial-motor-vehicle operators for temporary and non-recurring rations will be made to O.P.A. local War Price

and Rationing Boards rather than to O.D.T. district offices. These rations will be issued by local boards and any appeals from decisions of the boards will be handled by the O.P.A. Thus, the O.P.A. will have complete authority over the issuance of such additional rations.

The change is expected to improve service and be of much greater convenience to commercial-motor-vehicle operators, since operators will have available 5,500 O.P.A. local boards as compared with 142 O.D.T. district offices.

Applications for certificates of war necessity or for permanent changes in certificate allotments will be handled by O.D.T. district offices as in the past. Forms for making such applications may be obtained at all O.P.A. boards, and also at O.D.T. district and field offices and offices of county farm transportation committees. The O.D.T. will continue to certify permanent commercial vehicle needs and issue certificates of war necessity to cover these needs.

As a result of the transfer, the O.D.T. Highway Department regional and district organization is being changed to more nearly coincide with O.P.A. regional and district office locations and boundaries. These changes, effective October 15, are defined in O.D.T. Administrative Order 6B.

Regional changes include the closing of the ODT Highway Department office in Kansas City, Mo., reducing the number of regional offices from nine to eight. The district and field offices will be reduced to 93 district and 43 field offices with a total of 30 offices being closed.

There will be four conditions, under the new procedure, under which local boards will be authorized to issue a smaller ration than that allotted by the O.D.T. on the certificate of war necessity. These conditions are:

1. When the board has knowledge of discontinuance or reduction in the operations of the commercial-vehicle operator.
2. When the board has knowledge of the misuse of commercial rations and such misuse indicates an overissuance. (For example, the use of commercial rations in an operator's personal passenger car.)
3. When an applicant indicates to the board that his needs are less than those certified.
4. When an applicant fails to use all his ration, or fails to claim his ration within a reasonable time.

If none of these four conditions apply, O.P.A. boards will continue to issue rations in the amount certified by the O.D.T.

Under the amendment to the O.P.A. gasoline rationing order commercial-vehicle operators will hereafter return all unused or expired transport rations to their O.P.A. boards rather than to O.D.T. district offices as has been required in some instances in the past.

INDUSTRIAL TRUCK MODELS.—General Limitation Order L-112-A, governing industrial power truck models approved for manufacture, has been amended to permit a limited number of additional models to be made, the War Production Board said October 5.

Eleven of the 39 manufacturers on the approved list now may make additional models under the amendment. The remainder of the manufacturers either did not request permission to increase the number of models they make or their request was turned down as unnecessary or because the models involved used too many components or critical materials.

The change was made primarily to allow users to duplicate models already in service and thereby simplify the repair parts problem.

The 11 manufacturers and the number of additional models each is permitted to make follow: Atlas Car and Mfg. Co., Cleveland, five; Baker Raulang Co. Cleveland, four; Clark Equipment Co., Battle Creek, Mich., seven; Crescent Truck Co., Lebanon, Pa., two; Elwell-Parker Electric Co., Cleveland, three; Erickson Special Equipment Mfg. Co., Minneapolis, one; W. F. Hebard Equipment Co., Chicago, two; Ross Carrier Co., Benton Harbor, Mich., two; Towmotor Corporation, Cleveland, one; Yale and Towne Mfg. Co., Philadelphia, seven; Lift Trucks, Inc., Cincinnati, four.

TIRE PRICES.—Temporary retail ceiling prices for new off-the-road tires made with rayon fabric, previously established for the period August 10, 1944, to October 15, 1944, will be continued in effect until December 15, 1944, the Office of Price Administration announced October 14.

Ceilings for these tires, used principally on road construction equipment, are 112½ per cent. of the already-established maximum prices for the same type, size and ply new tires made with cotton fabric. Dollar-and-cent ceilings for cotton-fabric tires are listed in Maximum Price Regulation No. 528. The O.P.A. pointed out that manufacturers already have been granted permission to continue using until December 15, 1944, temporary price increases on these tires as well as on other types of tires, which previously also had been scheduled to end October 15, 1944.

The question of maximum prices for off-the-road tires made with rayon fabric is part of the general problem relating to the level of maximum prices for all sales of civilian replacement tires, which will be reconsidered before December 15.

(Revised Order No. 10 under Maximum Price Regulation No. 528—Tires and Tubes, Recapping and Repairing—effective October 14, 1944.)

TRUCK DRIVERS' WAGES.—A problem perplexing some producers of ready-mixed concrete as well as foundry and engine sands and railroad ballast is the question whether truck drivers delivering these materials are subject to the provisions of the Fair Labor Standards Act. The National Sand & Gravel Association and the National Ready-Mixed Concrete Association have been active in attempting to obtain from the Wage and Hour Division of the Department of Labor a ruling exempting the production of sand and gravel and ready-mixed concrete from the law's provisions on the ground that these industries are separate and distinct from the construction industry and should be so dealt with in the administration of that law. In Release G-162 issued May 15, 1941, the Wage and Hour Division declared that the industries producing these materials were not subject to the law "merely by reason of the use to which such products are put". That release distinguished between new construction and reconstruction and stated that if producers' employees "engage in certain road-repairing activities, such as spreading materials on the roadbed or rolling or pressing the road surface", they would be subject to the law. Vincent P. Ahearn, executive secretary of the associations mentioned, explains that this really means that if such employees go beyond the normal functions of the industry in which they are employed, they are engaging in work normally done by the employees of contractors and therefore might become subject to the law.

Some field representatives of the Wage and Hour Division have apparently been attempting to establish that the division has always held from the very beginning that certain employees of the sand-and-gravel and ready-mixed-concrete industries have always been subject to the law. In this connection Mr. Ahearn calls attention to a letter addressed by Perry Bertram, attorney of the Los Angeles solicitor's office of the Department of Labor, to a California ready-mixed-concrete manufacturer, in which it is claimed that truck drivers of a concrete company are subject to the Fair Labor Standards Act because they "pour concrete onto the road bed where the contractor's employes spread it in the reconstruction of an interstate highway". This same reasoning might apply, Mr. Ahearn suggests, to employees unloading sand and gravel on the road bed. The letter from the Department of Labor follows in part:

> The company [to whom the letter is addressed] is a dealer in ready-mixed concrete. It supplies ready-mixed concrete to building construction contractors at their order. The concrete is delivered in ready-mix trucks to the site of the construction work where upon arrival the truck driver is instructed by the contractor or his employees as to where the concrete is to be poured. When the truck is placed in the position desired, the contractor's employees remove from the truck the delivery chute, one end of which they attach to the discharge gate of the drum and the other end of which they place over the spot at which it is desired to have the concrete poured. The truck driver through controls located in the driver's compartment or on the running board opens the discharge gate, permitting the concrete to flow down the chute and into the forms, which may in the case of pouring concrete for the construction of a highway simply consist of "header boards" . . .
>
> As you know, it has consistently been the position of the Division that the repair, reconstruction or alteration of existing highways which are used for interstate commerce, is within the general coverage of the act. We have further been and are of the opinion that employees of a materials dealer who haul the materials to the site of the work are not within the coverage of the act unless they participate in the construction work itself. An example of such participation is the spreading of materials over the road bed.
>
> The question then is whether or not the work of the truck driver employed by the concrete dealer in connection with the pouring of the ready-mixed concrete into the forms prepared for receipt of the concrete constitutes sufficient participation in the construction to bring the truck driver within the act.
>
> Some of the opinions issued by our national office, I believe, are pertinent to the determination of this question. The Administrator has said, for example, that the delivery of ready-mixed cement by transit-mix trucks to the site at which an oil-well derrick is to be constructed is subject to the act if the truck driver assists in the placing of the concrete in the forms prepared for the foundation of the derrick. The theory behind this opinion is that pouring the concrete into the foundation is an integral part of the erection of the oil-well derrick and as such is necessary to the production of oil.
>
> I believe that this opinion requires the conclusion in the instant case that the drivers of the ready-mixed-concrete trucks who pour the concrete onto the road bed where the contractor's employees spread it in the reconstruction of an interstate highway thereby participate sufficiently in that reconstruction to be subject to the act. . . .

Davey Compressor Company, Kent, Ohio, recently named the following new distributors: Air Compressors Rental Company, and Meco Sales Company, both of Cleveland. The first named will cater to the industrial field, handling a complete line of Davey compressors and parts; and the latter will combine complete sales and rental facilities for portable compressors in the contracting field.

62 Years Without Major Stop is the Record of Pioneer Quarry of Midwest

By WILLIAM M. AVERY

another ON THE SPOT report

ONE of the oldest quarries in the Middle West is still in operation a few miles south of East St. Louis, Illinois. Opened in 1882, the Casper Stolle quarry has been worked for 62 years without a major interruption. The founder, Casper Stolle, actually started in the business in 1846, when he entered the quarrying and contracting field at St. Louis, Missouri. The firm, which he later organized at East St. Louis, and which was incorporated in 1892 as the Casper Stolle Quarry & Contracting Company, is operated today by his son, F. W. Stolle, who is president and general manager.

The quarry is now about 400 feet wide and 1,800 feet long. There are two operating levels, one about 70 feet below grade and the other about 110 feet below grade. The overburden averages approximately 3 feet in depth. All the drilling is done with 2 Sanderson Cyclone well drills, one of which has been in operation for more than 20 years. From 20 to 60 holes are shot at a time, using Gold Medal 40 per cent. gelatin and Primacord. While an average shot will bring down from 40,000 to 60,000 tons of rock, single blasts have on occasion brought down as much as 100,000 tons. Due to the large amount of secondary blasting the yield averages somewhat under 3½ tons of rock per pound of powder.

View into quarry with crushing plant in the distance; the plant showing on the right is not in use.

A Bucyrus-Erie 50B electric shovel with a 1¾-cubic yard bucket loads the rock into the 3- and 4-cubic yard end-dump cars which operate on a 36-inch gauge track. The cars are moved in trains by Whitcomb gasoline locomotives to the base of the incline. An Allis-Chalmers single-drum friction hoist hauls them up one at a time, and they discharge directly into an Allis-Chalmers 8-D gyratory crusher.

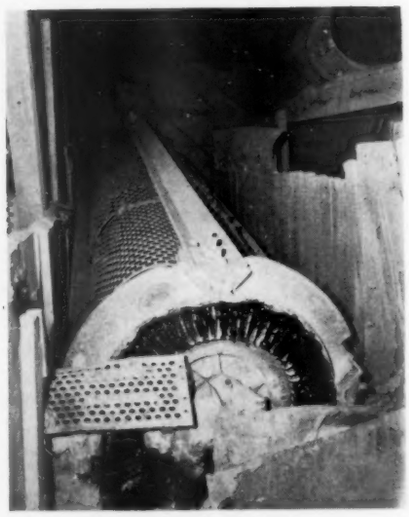
From the primary crusher the rock is elevated some 70 feet to the top of the plant, where the flow is divided between two parallel rotary screens, one 48 inches in diameter and 18 feet in length, and the other 36 inches by 18 feet. Each of these Allis-Chalmers trammels has 1-inch mesh screen in the first third, 1½-inch mesh in the middle third and 2-inch mesh in the last third of its length. The minus-1-inch stone drops into a 14-inch bucket-elevator and is discharged on a 4- by 5-foot double-deck Tyler-Hummer screen. The oversize from the 7/16-inch-mesh top deck and from the 5/32-inch-mesh bottom deck drops into bins and is marketed as aggregate; while the minus-5/32-inch material is sold as agricultural limestone.

The minus-1½-inch and the minus-2-inch fractions passing through the screens drop into separate bins and are classed as road- and ballast-grade stones. Two secondary crushers, a Symons 3-foot cone and an Allis-Chalmers Number 5 gyratory, receive the plus-2-inch material; the recrushed material

Left: Dumping material into concrete hopper, from which it is fed into the pulverizer plant shown here.

Right: Well drills working on ledge.

Above: The 3-foot cone-crusher in the new plant.
Right: Weighing out a truck load of ag-stone on 24-ton platform scale.



Above: 42-A bucket loader filling a dump in the main plant.
Left: 42-A bucket loader filling a dump truck.

Oversize from the 3-by-10-foot three-deck screen discharging on the conveyor.

Type C 30.40 pulverizer in the new plant, showing V-belt drive.

passes over a 24-inch by 30-foot belt-conveyor and is joined with the discharge from the primary crusher to be recirculated through the screening plant.

16-inch-by-70-foot belt conveyor feeding the new plant.

Although the plant just described can crush about 700 tons of stone in an 8-hour day, only a small fraction of its production is marketable as agricultural limestone. Recognizing the importance of this rapidly growing market, the management of the company late in 1943 started

The 8-D gyrator crusher in the main plant.

work on a reinforced-concrete addition to the main plant in order to increase the production of agstone. The new plant, which includes two 125-ton capacity bins, went into operation in April of this year, and is now producing about 350 tons of agstone per 8-hour day.

Various sizes of stone from the main crushing plant are used as feed for the pulverizing plant. Drawn directly from the bins or taken from stock piles in the yard, the feed stone is hauled by truck to a ground-level hopper, which has an adjustable gate for regulating the rate of flow to a 16-inch by 70-foot belt-conveyor. The conveyor, which is equipped with Link-Belt idlers and a Raybestos Manhattan belt, discharges directly into a Symons 3-foot cone crusher. Raised to the top of the plant by a 16-inch by 60-foot bucket-elevator, the stone drops on a 3- by 10-foot triple-deck Diamond vibrating screen located directly over the bins.

The oversize from the top and middle decks (⅜- by ¾-inch mesh and ⅜- by ⅜-inch mesh) passes over a short belt-conveyor into a chute which discharges into an American type C, 30.40 pulverizer

F. W. Stolle

fitted with ½-inch grate bars. The pulverizer is in closed circuit with the screen at the top of the plant.

The bottom deck of the triple-deck screen is fitted with 5/32-inch mesh cloth, and the material passing through drops into one of the two bins as finished agstone. The plus-5/32-inch stone drops into the remaining bin and is sold as aggregate for concrete products and seal-coat for asphalt paving.

The company has a well-equipped shop where general repair work and welding can be handled. A Pennsylvania stationary compressor supplies air for jack-hammer work and for the occasional operation of an Ingersoll-Rand wagon drill in working the top ledge of the quarry. Two Barber-Greene bucket-loaders (a 42-A and an 82-A) operate in the yard for loading trucks from the stock piles. Two platform scales, a Howe 24-ton and a Winslow 18-ton,

Virgil Mallett, left, General Superintendent. Right, T. H. Hirsch, Plant and Quarry Superintendent.

are used for weighing out trucks, which have constituted the plant's sole shipping medium since the interruption of railroad service two years ago.

In addition to the president and general manager, F. W. Stolle, the company officers include H. W. Balthrope, secretary, C. A. Stolle, sales manager, Virgil Mallett, general superintendent, and T. H. Hirsch, plant and quarry superintendent.

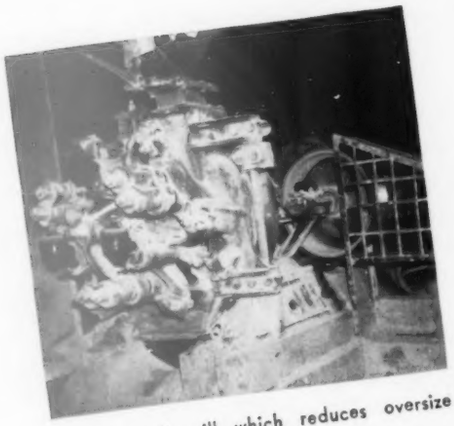
Magnesium Ass'n Appoints Perry D. Helser Secretary

The recently formed Magnesium Association, with headquarters at 30 Rockefeller Plaza, New York, has selected Perry D. Helser as secretary-director. The purpose of the association, whose membership includes producers, fabricators, smelters and consumers, is to develop the use of magnesium and its products, and to advance technological processes in the industry. Other officers are: E. S. Christiansen, vice president, Apex Smelting Company, Chicago; C. C. Loomis, president, New England Lime Company, Cannan, Connecticut, vice president; and C. E. Larson, manager of operations, White Metal Rolling and Stamping Company, Brooklyn, treasurer.

Pioneer Engineering Works, Inc., of Minneapolis, Minnesota, have announced the appointment of the Anderson Engineering Company of Cambridge, Massachusetts, to represent them in the States of Maine, New Hampshire, Vermont, Rhode Island, and Massachusetts, excepting the four western counties. The Tyler Equipment Corporation of Springfield, Massachusetts, was named to represent them in the State of Connecticut (with the exception of Fairfield County)—and in the four western counties of Massachusetts.

Maine Lime Producer Concentrates On Agstone for Duration

The 10-foot separator which rejects coarse for recrushing.



The ring-roll mill which reduces oversize from separator.

The hammer-mill which does primary crushing and its pan-feeder.

Nowhere is there a better example of what changing conditions can do to a thriving industry than in the Rockland-Rockport district of Maine. It is said that the first lime burned in this country was made in this area well over one hundred years ago. By the middle 1880's this area had become the main source of lime in this country with 37 plants, mostly small 1- and 2-kiln operations. Most of the output was shipped by a fleet of schooners to Boston, New York, and other points along the Atlantic Coast. The growth of railroad transportation, however, soon made possible the development of inland deposits and the industry gradually died out in Maine. Now only two producers remain.

One of these is the Rockland-Rockport Lime Company, Inc., Rockland, Maine, which in 1927 operated 42 vertical kilns and produced 100,000 tons of lime, both quick and hydrated. As the demand for this product began to fall off, even before the depression, the company began to push the production of chemical and metallurgical limestone and, in 1931, agricultural limestone. After the war began the lime-hydrating department was shut down for the duration and agstone is now the most important product. Most of the quicklime now produced is used by the chemical industries.

The original agstone plant built 13 years ago has been replaced by two others known as Plants 2 and 3. Now the labor shortage is so severe that only Plant 3 can be operated in spite of the fact that more than double its 1-shift output of 100 tons could be sold. Even under these conditions the company has supplied a large percentage of A.A.A. (Agricultural Adjustment Agency) requirements since the formation of that body. In 1943 the state used 90,000 tons.

The company has an unusually wide range of stone in its deposits which vary from high-calcium to high-magnesian limestone. There is a considerable demand in Maine for the latter for potato and orchard lands having a magnesium deficiency. Incidentally, Maine is said to be the only state in which high-magnesian agstone can be obtained through the A.A.A. Two quarries are now being operated to supply these two types of agstone, one having stone of about 95 per cent. calcium-carbonate content, the other stone with 18 to 22 per cent. of magnesium. These are operated alternately as the demand requires.

At Plant 3 the stone is discharged from trucks into a hopper from which a Link-Belt pan-feeder discharges it into a No. 40 Williams hammer-mill. The ¾-inch-minus rock from this mill is carried by a belt-conveyor to a bucket-elevator from which it is discharged into a bin which is the shell of a former vertical lime kiln. A pan-feeder, driven through a Reeves variable-speed drive, discharges this stone into a Jeffrey hammer-mill. A bucket-elevator feeds the product of this mill to a 10-foot Sturtevant separator. The coarse rejects of the separator go to a No. 2 Sturtevant ring-roll mill which feeds back into the elevator, forming a closed circuit. The finished agstone from the separator drops into a 150-ton steel bin under which are two St. Regis 2-tube packers. Two-ply, 100-pound paper bags are used.

The A.A.A. specification requires that 100 per cent. of the material pass a 20-mesh and 40 per cent. a 100-mesh screen. In this plant the agstone is actually ground to 100 per cent. through a 20-mesh and 80 per cent. through a 100-mesh screen.

The entire output is sacked and is sold either f.o.b. at the plant in railroad cars or delivered to the farms in trucks. No bulk sales are made and no spreading is done by the company.

John D. Gregg of Whittier, California, head of a sand-and-gravel firm with producing plants at Roscoe and Monrovia, California, was elected president of the Whittier Building & Loan Association at a meeting of that organization on October 11. Mr. Gregg is a nephew of the late Wallace Gregg, founder and first president of the building-and-loan association. Besides his sand-and-gravel interests he is president of the Los Angeles Land & Water Company, a corporation owning approximately 1,100 acres in the San Fernando Valley, and executive vice-president of Rose Hills Memorial Park, one of southern California's most beautiful cemeteries located in the Puente Hills, northwest of Whittier.

Expert Discusses Problems of Off-Road Haulage Units In Pits and Quarries

Part II

By H. K. CHURCH, C. E.
District Representative
Euclid Road Machinery Co.

another P&Q exclusive

IN a previous article, first of the series, we dealt with the type "A" truck and used it as a basis for the development of several worth-while characteristics in a heavy-duty-truck for open pit and quarry work. In this article we will treat some typical operations of the type "A" truck.

Quarry Haulage At Hillsville, Pennsylvania, in the quarry of the Lake Erie Limestone Company is a fleet of 15-ton Diesel "load-on-back" trucks. For about three years these 10 trucks have been hauling overburden and stone in connection with the production of fluxing stone for the steel mills.

GENERAL SPECIFICATIONS OF TRUCK

Rated load capacity..30,000 pounds
Tare weight .....31,000 pounds
Gross vehicle weight..61,000 pounds
Diesel-engine horsepower.....150
Tires, front steering, single.....
.....12.00 × 24
Tires, rear driving duals.....
.....14.00 × 24
Body capacity, level, cubic yards.11.3

Overburden Removal.—The overburden consists of a mixture of earth and rock, rock predominating, to a depth of 25 to 40 feet. A 2½-cubic yard Diesel shovel loads this material into the trucks after it is drilled and

Figure 1. Shovel loading type "A" load-on-back truck with five buckets of earth.

shot (Figure 1). The overburden haul is about 1,800 feet long with an upgrade of about 3 per cent. The haul road is pretty well maintained but is fairly rough at the dumping area (Figure 2). The average load, bank measurement, is 8.0 cubic yards for the 11.3-cubic yard body.

A typical time study of a truck cycle on the overburden haulage shows:

Loading 5 buckets from the 2½-cubic yard shovel	1.7 minutes
Hauling 1,800 feet at average 8.2 miles per hour	2.5 minutes
Turning and backing on the fill	.6 minute
Returning 1,800 feet at average 10.7 miles per hour	1.9 minutes
Turning and backing to the shovel	.5 minute
Total net cycle time..	7.5 minutes

On this cycle each truck makes about 6.6 loads per working hour and hauls about 53 cubic yards of overburden, bank measurement, hourly.

Over-all production figures indicate that, in about 9,800 hours of shovel loading, about 30,700 truck-hours of hauling resulted in the haulage of about 1,420,000 cubic yards of overburden, bank measurement.

Hourly Cost of Ownership and Operation.—[Note: In these articles there will be no attempt to give actual units of costs as obtained by the operators. We shall simply submit what may be termed a fair estimate of costs based on our experience with the several types of trucks under consideration. The costs of trucks will be based on about 40 cents per pound for truck or tractor and about 20 cents per pound for trailers. Tires will be given an over-all life of about 3,000 hours and about 15,000 miles.

Figure 2. Truck hauling about 2,000 feet to spoil bank for overburden.

Figure 3. Truck taking 4-cubic yard loads from shovel and empty truck returning for load.

Depreciation periods will be about 5 years of 3,000 hours each or about 15,000 hours. All these figures will be varied if the particular operation requires a non-uniform treatment.]

Data

Cost of truck	$12,000.00
Cost of set of tires and tubes	1,500.00
Net cost of truck for figuring depreciation	10,500.00
Depreciation period, 5 years of 3,000 hours each	15,000 hours

Elements

(a) Interest, taxes, insurance, storage of 10% of average investment of truck per year of 3,000 hours	$0.24
(b) Depreciation, straight-line method of calculation with no allowance for salvage value	.70
	$0.94
(c) Mechanical repairs and replacements and labor thereto	$0.60
(d) Tires and tubes, complete set every 3,000 hours	.50
(e) Diesel oil, 3 gallons at 8 cents	.24
(f) Crankcase oil, 0.1 gallon at 60 cents	.06
(g) Grease and greasing labor	.12
(h) Driver and compensation	1.00
	$2.52
Total hourly cost of ownership and operation	$3.46

On the basis of an hourly cost of $3.46 for each truck and a production of 53 cubic yards, bank measurement, for each truck-hour on the particular haul, the unit cost is 6.5 cents. This unit cost of course does not correspond to the figure actually obtained by the operating company over a long period of time.

Figure 4. A relatively short stone hauling operation of 650 feet, one way.

When the type of equipment (Figure 3) was selected several requisites for satisfactory operation were emphasized. Adaptability was considered because the truck was to be used in both overburden removal and stone haulage in the quarry, on short hauls and on long hauls, and in a variety of loading and dumping conditions. The ratio of slipping-point tractive force to gross vehicle weight was important because of the slippery grade conditions encountered on the overburden haul. The ratio of tare weight to load capacity was considered because the truck would have to be strong enough to take the impact loads from a 4-cubic yard loading shovel. Of course, attention was paid to all the other six factors (mentioned in the previous article), but chief emphasis was placed on the three factors just named. An unusually fast hauling cycle for the quarry haul shows:

	Minutes
Loading average 15.1 tons by 4 buckets from 4-cubic yard shovel	1.9
Hauling 2,800 feet on level at average of 15.9 miles per hour	2.0
Weighing load	.2
Hauling 200 feet to crusher and backing	.5
Dumping	.3
Returning 3,000 feet at average of 17.0 miles per hour	2.0
Turning at shovel	.3
Net cycle time	7.2

Production and Unit Cost.—On the basis of a 50-minute working hour each truck would make 6.9 loads hourly and would haul 104 tons of stone hourly. Actually during the working day of 12 hours three trucks hauled about 3,770 tons of stone at the rate of 105 tons per truck hour.

Assuming an arbitrary figure of $3.46 per truck-hour, the total unit cost is 3.3 cents per ton or 5.8 cents per ton-mile of work.

Figure 5. Type "A" two-axle load-on-back truck of 15-ton capacity.

Ore Haulage Another interesting operation is that of the Mahnomen Mine of Minnesota. Ore is hauled from the lowermost level of a typical Mesabi open pit mine up to the rim of the pit.

The haul roads in these operations are generally good and the loading shovels are of 4-cubic yard bucket capacity. The ore weighs about 4,000 pounds per cubic yard. Sometimes there is as much as 300 feet

Figure 6. An overburden waste dump in flat country. Top is about 75 feet above grade of excavation.

difference in elevation between the loading point and the dumping point and the haulage problem is one of overcoming vertical height of lift rather than horizontal distance.

In the selection of a type of truck for this service the buyer was interested in the following important characteristics:

1. High ratio of horsepower to gross vehicle weight because of the continuous uphill pull of the loaded truck.

2. High ratio of slipping-point tractive force to gross vehicle weight because of the uphill hauling conditions and the severe weather prevailing in Minnesota.

3. Good ratio of tare weight to load capacity because of the large loading shovels and generally severe service.

The truck in use (Figure 5) has a 225-horsepower engine and, with an average load of 14.5 tons, the gross vehicle weight is about 28.5 tons. The ratio of horsepower to gross vehicle weight is 7.9 horsepower per ton.

Typical Hauling Cycle.—According to information developed at the University of Minnesota Symposium of 1941, these trucks performed approximately as follows on a typical hauling cycle:

Length of haul, one way	4,700 feet
Difference in elevation or vertical lift	265 feet
Average uphill grade	5.6 per cent.
Loading time, two buckets from 4-cubic yard shovel	0.8 minute
Dumping and maneuvering time	1.8 minutes
Hauling and returning, 9,400 feet at average of 14.4 miles per hour	7.4 minutes
Net cycle time	10.0 minutes

While no figures are given for the travel time going uphill, they can be calculated roughly by assuming that the wheel horsepower is 75 per cent. of the rated horsepower of the engine or 169 horsepower, that the haul-road rolling resistance is about 60 pounds per ton, and that the gross vehicle weight is about 28.5 tons. On an average grade of 5.6 per cent. the calculated travel speed is 12.9 miles per hour. The uphill hauling time would be about 4.1 minutes. The downhill returning time would be about 3.3 minutes and downhill travel speed would be about 16.2 miles per hour average.

Estimated Average Production.—It has been demonstrated many times that the use of the 50-minute working hour closely approximates actual working conditions in a well-managed job. The procedure is to divide 50 minutes by the net cycle time in order to arrive at the average loads hauled per truck-hour. On such a basis each truck would make 5 trips hourly and would haul 14.5 short tons each load, giving a total of 72.5 short tons hauled per truck hour.

Costs. — The Symposium developed that operating expenses on the trucks were about $2.84 hourly. Adding $1.04 for hourly fixed charges gives a total of $3.92 for hourly ownership and operation cost. This figure is about 10 per cent. higher than that of our estimate for average type "A" load-on-back trucks, and the increase is due to higher engine horsepower which tends to increase operating expenses.

The resulting unit cost for haulage is 5.4 cents per short ton or 6.0 cents per long ton of 2,240 pounds. Expressed in terms of vertical lift for this uphill haul, the unit cost is 2.27 cents per long ton per 100 feet of vertical lift.

Stone Haulage Another interesting example of uphill hauling of both overburden and stone is in the quarry of the National Limestone Company at Carey, Ohio. The W. A. Lutz Company of Bucyrus, Ohio, handles the haulage and type "A" load-on-back trucks were selected for this work about two years ago. Again the operator was

Figure 7. Haul of 700 feet at 8 per cent. grade. Each truck hauls about 130 tons of stone per hour.

looking for definite characteristics in the proposed truck.

Adaptability was very important since the same trucks were to be used in both overburden removal and in stone haulage.

The quarry is in flat country and the stone is about 20 to 30 feet below the surface and extends to a depth of about 80 feet below the surface. The overburden has to be wasted by means of a continuous uphill haul as illustrated in Figure 6. This uphill haul is about 1,500 feet long and it involves a vertical lift of about 75 feet. Similarly, the stone haul requires lifting rock from the floor of the quarry to the elevation of the plane separating the quarry stone from the overburden. The work is illustrated in Figure 7. Here are shown one truck being loaded by the 4-cubic yard shovel, another truck waiting to back in for a load, a third truck ascending 700 feet of 8 per cent. grade, and a fourth truck backing into the primary crusher at the plant. These two uphill hauls for overburden and stone called for a high ratio of engine horsepower to gross vehicle weight and the truck selected has a ratio of 5.0 horsepower per ton of gross vehicle weight.

Because of heavy slippery grade conditions due to rain and snow it is good in this case to have a high ratio of slipping-point tractive force to gross vehicle weight. The equipment selected has 75 per cent. of its gross vehicle weight on the driving wheels. No higher ratio is obtainable except in type "B" 3-axle tandem-drive trucks or in all-wheel-drive trucks.

Figure 8 shows the weighing operation. The average load is 4 to 5 buckets from the 4-cubic yard shovel, giving an average truck load of 15 short tons.

Hauling Cycle on Stone Haulage.—A typical hauling cycle from the bottom of the quarry floor to the primary crusher shows:

Loading 15 tons under 4-cubic yard shovel by 4 to 5 buckets...	2.0 minutes
Hauling 700 feet up 8 per cent. grade at average of 4.7 miles per hour	1.7 minutes
Turning and dumping into crusher	.8 minutes
Returning downgrade at average of 7.9 miles per hour.....	1.0 minutes
Turning at shovel.....	.3 minutes
Net cycle time.....	5.8 minutes

Figure 9 shows the dumping operation. The truck comes in from the left at the top of the grade, turns 90 degrees to the right, and backs into the crusher. The entire operation requires about 50 seconds.

Production.—Each truck averages about 8 loads per working hour, giving an average of about 120 tons of stone hauled per truck-hour. Usually 3 trucks are kept on stone haulage but sometimes 4 machines are used to advantage, when the shovel loading time per truck is at the minimum.

Costs.—If we assume that the average hourly cost of ownership and operation is about 3.46 per cent., then the unit cost is about 2.9 cents per ton.

Prorated on the basis of vertical lift, the unit cost is about 5.0 cents per ton per 100 feet of vertical lift. This unit cost for vertical lift seems high when compared with figures for other uphill haulage, but one must keep in mind that the haul is extremely short and uphill haulage projects are more costly per unit of distance as the length of haul becomes shorter.

Bureau Reports on West Coast Production of Non-Metallics

The output of war materials by California's mines and quarries gave that state third place in the nation in the production of mineral commodities last year, the Economics and Statistics Branch of the Bureau of Mines, United States Department of the Interior, has announced. The state's 1943 mineral production was valued at $569,386,000.

The federal Bureau of Mines stated that nonmetallic minerals were valued at $88,293,000 and metallic minerals at $33,109,000.

Cement led among California's nonmetallic minerals with $27,517,926. The state held first-place position in the national scene in sand and gravel, diatomite, sodium carbonate and sodium sulphate, and boron mineral production.

California's contribution in dollar value of minerals constituted 8.66 percent. of the total production of the 48 states and Alaska.

Oregon was second in the nation in diatomite production. Diatomite, a nonmetallic composed of the tiny, skeletal remains of diatoms—water plants—is found principally in the area east of the Cascade Mountains in Oregon. Resembling chalk, its principal industrial uses are as filters, fillers, insulators, abrasives, and building materials.

Metallic minerals produced in Oregon last year were valued at $1,346,000, but the nonmetallics, chiefly sand and gravel, cement, and stone, in that order, led with $10,964,000.

Figure 8. Automatic recording of loads averaging 15.1 tons takes about 0.2 minute.

Figure 9. Dumping into crusher is a quick operation. High dumping angle is especially important in handling overburden.

Recovery of Carbon Dioxide a Source for Rich By-Product in Lime Industry

By RALPH GIBBS
Consulting Chemical Engineer

THE recovery of carbon dioxide, in some commercial form, is not generally attempted in the lime industry although this industry as a whole probably handles more carbon dioxide than any other single industry in the country. No doubt many factors contribute toward allowing this seeming waste of such a useful and valuable commodity. It might be mentioned, however, that one of the largest individual plants in the country producing solid carbon dioxide has lime-kiln gas as its source of this product.

A near approach to the ideal lime-carbon dioxide recovery arrangement is the retort type lime kiln. In this kiln the carbon dioxide evolved in the retorts is substantially pure, and costly purification steps are not necessary as is the case where the combustion gases and the evolved stone gases are mixed. Although the retort type kiln in its original form was a costly arrangement to install, no doubt the factor that contributed largely to its abandonment as a commercial piece of lime-burning equipment was the comparative instability of the retort material under conditions of operation, and the resulting short life of the retorts. It would seem that some modifications in design and the use of some of our modern heat-resistant irons and steels could be incorporated into a commerically successful lime kiln and carbon-dioxide generator. Much experimenting would have to be done and an ample supply of money would have to be available to produce the desired results.

In the meantime, and while awaiting further developments in the retort type lime kiln, we must confine ourselves to a study of the equipment existing at the present time and find out how it adapts itself, or can be adapted, to the commercial recovery of carbon dioxide.

The Rotary Kiln To-day much of the lime, as well as refractory dolomite, is processed in rotary kilns and the adaptation of the rotary kiln to carbon-dioxide recovery offers no particular difficulties. In a previous article[1] related to the subject, the writer went into a preliminary study of gas quality and available heat in the exit kiln gases, and the reader is referred to that article for more details.

● According to the author, "taken as a whole, probably no other basic industry operates with less technical knowledge and personnel than the lime industry. Most of the officials, owners, managers and superintendents are non-technical men and are satisfied simply to produce lime. To go into a line of endeavor completely foreign to their one activity and about which they know so little does not make sense to them. In other words, they are afraid of it."

The initial investment for a plant to recover commercial carbon dioxide IS high, and this is another deterrent, the author says. In many instances the lime plant is owned by an individual or a family who does not want to feel that the soundness and safety of the investment will depend upon personnel who can not be easily and quickly replaced. The established carbon-dioxide industry, he adds, is not desirous that new sources of this commodity be set up and consequently will not offer any encouragement to the development of new carbon-dioxide producing facilities.—Directing Editor.

In any event, there are several factors in connection with carbon-dioxide recovery from lime-burning rotary-kiln gases that must be seriously considered. In no instance has the kiln been designed with the object in mind of recovering the carbon dioxide. Considerable heat is required in the carbon-dioxide purification process and power is required to compress the purified gas to put it into a commercial form. If the rotary kiln has the proper proportions of diameter and length, it will produce the desired quantity of product and at the same time waste-heat boilers can be installed to supply a limited amount of power and exhaust steam for processing the carbon dioxide. Otherwise the advisability of installing waste-heat boilers is an individual problem for each kiln. With long kilns, or those having a high ratio of length to diameter, the exit gases will leave them at comparatively low temperatures and waste-heat boilers might not prove their worth. The same can be said for kilns burning lime carbonate sludge or slurry. In these cases it will be necessary either to buy steam and power or to install a steam boiler and power-generating equipment.

However, and regardless of these circumstances, there are other items that must be given thorough consideration.

First, good firing practice must prevail, not only for the economy of the lime-burning operation, but to assure the best possible quality of kiln gas commensurate with the production of a suitable lime product. The fuel-lime ratio must be as low as possible to insure the best attainable quality of exit kiln gas. Figure 1 shows how the quality (CO_2 content) of the kiln gas decreases and how the quantity of kiln gases increases as the fuel-lime ratio increases.

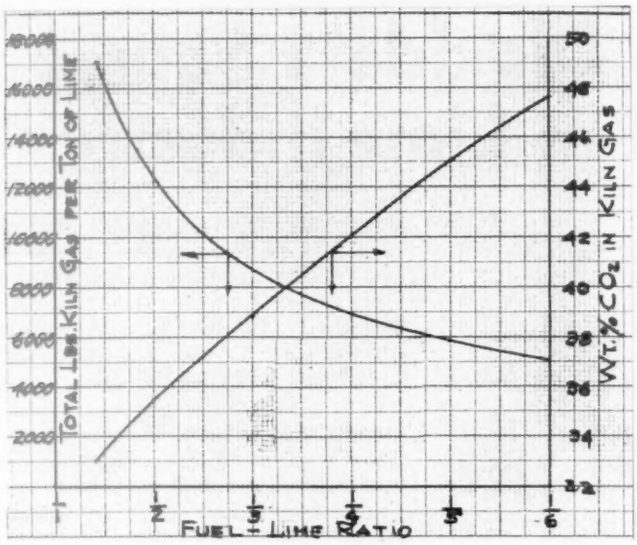
In the control of the combustion process the use of the continuous electrical gas analyzer offers many advantages. A continuous record or indication is always before the kiln operator so that almost immediately necessary changes in the air or fuel regulation can be made.

Second, the fuel supply to the kiln must be easily and accurately controlled. Either a surplus or deficiency of fuel is not only costly, but will also affect the quality of the gas for carbon-dioxide recovery.

Third, the leakage or ingress of air at the feed end of the kiln is to be avoided if the quality of the gas is to be maintained. Figure 4 shows a diaphragm type of seal that works well.

In order further to stress the importance of gas quality. Figure 2 is presented and will be discussed more fully later. This family of curves shows the number of pounds of kiln gas that must be handled per minute to produce 10 tons of carbon

[1]Chemical and Metallurgical Engineering, April, 1944, page 109.



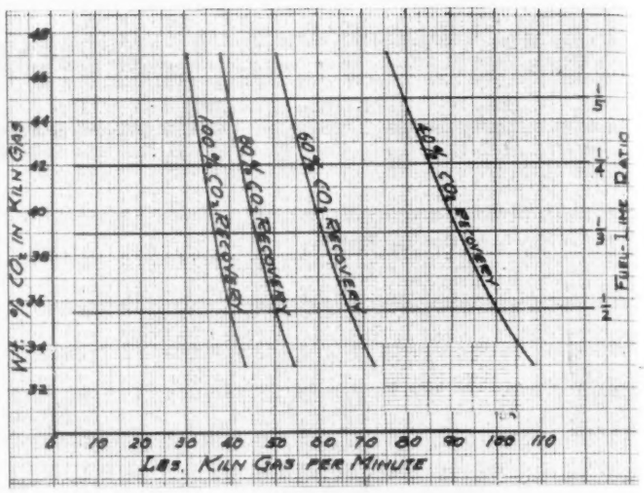


Figure 1 (left). Figure 2 (above).

dioxide per day for various qualities of gas and for different recoveries.

The Shaft Kiln The shaft type of lime kiln can be adapted to the recovery of carbon dioxide by incorporating appropriate seals at the top to prevent the ingress of air. Such a seal will be the conventional "bell" type.

Generally a properly operated shaft kiln has a very good fuel-lime ratio and thus evolves a kiln gas rich in carbon dioxide. The stoker-fired type offers a definite advantage in that no excess fuel is fired at any one time, as is the case with a hand-fired shaft kiln with the black smoke issuing from many operations subsequent to firing. Such overfiring to the point of producing a heavy smoke is not desirable since the smoke will contaminate the solutions and equipment to an undesirable degree.

Substantially the same type of gas-purifying equipment will be used with shaft as with rotary kilns.

Lime Producers Probably the most recent development in lime-burning is the small, compact, thermally efficient lime kiln appropriately called a "lime producer." Not much has been heard of this equipment, but it is economically justified and more than casual interest eventually will be manifested in it by the lime industry.

Because of its engineering and economic features, the lime producer lends itself very well to the recovery of carbon dioxide. In order more fully to explain this statement, the lime producer will be discussed in some detail.

The equipment of the lime industry has progressed from the crude early methods of the artisan to that of the present day with exact scientific control. Much of the equipment in use to-day is not the result of applied enginering principles. Rather is it the result of "cut-and-try." Thus, many of the kilns in use to-day do not represent the ultimate of our present engineering knowledge. Consequently there is an opportunity to incorporate in a piece of lime-burning equipment certain engineering features that seem desirable at the present time.

For example, it is believed by one school of thought that the small-capacity unit will have a definite place in the scheme of things in the future. Thus a 10-ton per day lime-producer unit can be installed in any community where its product can be absorbed instead of having a large kiln or battery of kilns adjacent to the quarry operation. It has been proposed also to have a carbon-dioxide recovery plant in connection with the lime producer. First, however, it will be in order to discuss the features of the lime producer and their bearing on the recovery of carbon dioxide.

The efficient burning of lime involves a series of problems related to the transfer of heat to the calcining stone. Of the three possible means of transferring heat, only two are really within our control, these are radiation and convection. To utilize the laws of radiation to their greatest advantage, we will have the combustion process occur very close to the surfaces of the pieces or particles being heated. To utilize and apply the laws of convection-heat transfer to their greatest degree and effectiveness we must have a nice balancing between gas and stone velocities. This has all been taken into account in the design of the well-built lime producer.

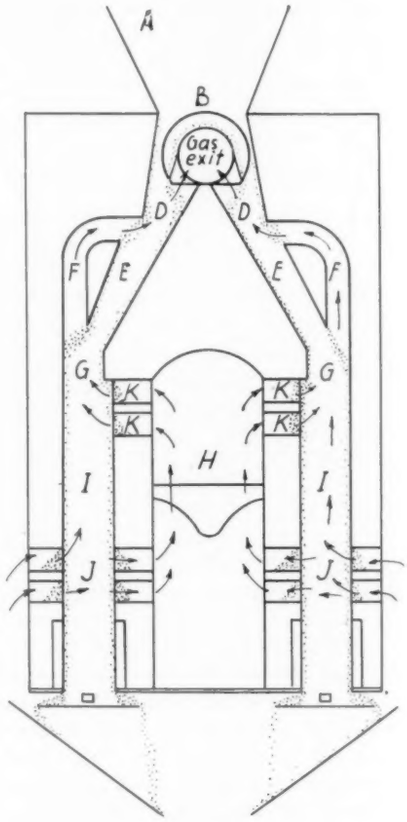


Figure 3.

Figure 3 shows a section of such a lime producer. The stone enters the top of the producer, *B*, from the feed hopper, *A*, where it passes over the finned exit-gas duct, *C*, heating the stone and further cooling the exit gases. The stone velocity here is at the optimum rate of travel. When the stone has passed below the level of the exit-gas duct, it is in the exit-gas stream, *D*, where both the stone and the gas are traveling at high velocities to facilitate convection-heat transfer. Below this zone the gas and the stone take separate paths, *E* and *F*. The stone,

however, receives some additional heat from the furnace roof. At *G* the stone enters the radiant heat transfer zone, where surface combustion of some of the fuel occurs. *H* is the stoker or oil-fired furnace. After passing through the hottest part of the stone passage, the lime enters the soaking zone, *I*, where residual carbon dioxide can be evolved. Then it passes through the lime-cooling and air-preheating section, *J*, before passing through the steam generator for subsequent discharge.

It will be noted that air for combustion is drawn through the bed of hot lime particles, and a portion will take either of two courses. One course is up through the fuel bed, if the producer is stoker-fired, and the other is up through the bed of cooling and soaking lime. The total air quantity will be so regulated that that portion passing through the fuel bed will be insufficient for complete combustion yet sufficient to gassify the fuel. This gassified fuel passes from the furnace through the ports, *K*, at a high temperature into the body of calcining stone, where it meets the air stream which took the course up through the bed of lime. Where this air and the fuel gases meet, a second combustion process takes place on the surface of the calcining stone, resulting in a concentrated and intense heating effect at the place where it will be of the greatest value.

Such a piece of lime-burning equipment will make possible very low fuel-lime ratios so that the exit gases from the lime producer will be very rich in carbon dioxide.

Lime-Kiln Gas Purification The conventional method for the purification of the kiln gases in the recovery of carbon dioxide is rather simple. First, the gas must be scrubbed with water to cool the gas enough to enable it to be handled safely subsequently, and to remove sulphur dioxide and dust. A suitable gas exhauster draws the gases from the kiln through the gas scrubber (Figure 5). From the exhauster the scrubbed gases are delivered to the absorption tower or towers (Figure 6). Absorption towers can be of the bubble-cap, plate or packed type, down which is flowing the solution for selectively absorbing the carbon dioxide. This solution can be either sodium or potassium carbonate, or one of several organic amines which are effective but costly.

The gases exhausted from the absorption tower will have a carbon-dioxide content substantially reduced from its original value, while the solution passing from the bottom of the tower will be enriched in carbon dioxide.

From the absorption tower the carbon-dioxide solution is pumped to the reboiler through a series of heat exchangers. In the reboiler the carbon-dioxide solution is heated to the boiling point, which operation evolves the pure carbon dioxide. This pure carbon dioxide is then stored in a gas holder for subsequent processing.

In the absorption tower the kiln gases are brought into intimate contact with the carbon-dioxide absorbing solution. Since the rate of absorption of the carbon dioxide is, among other things, a function of the quantity of carbon dioxide in the gases coming from the kiln, it is readily understood why a kiln gas rich in carbon dioxide is desired. This, in turn, will allow the use of smaller equipment, which reduces the investment charge.

This is made possible by the fact that, at least initially, the recovery of all the carbon dioxide in the kiln gases will not be required. As an example, it might be assumed that it is desired to install a 10-ton per day carbon-dioxide recovery unit on a rotary lime kiln producing 100 tons of lime per day. In the article cited the author presented a rather complete survey of rotary kiln gases and some of the features of the recovery of carbon dioxide from them. These data show that, with a fuel-lime ratio of ⅓, about 170 tons of carbon dioxide per day is evolved in the kiln gases. This constitutes approximately 38.9 per cent. of the weight of these kiln gases or 28.9 per cent. of their volume. Thus, we can afford to be rather wasteful, since we wish to recover only about 6 per cent. of the total carbon dioxide evolved.

Under these conditions we may choose to handle more of the kiln

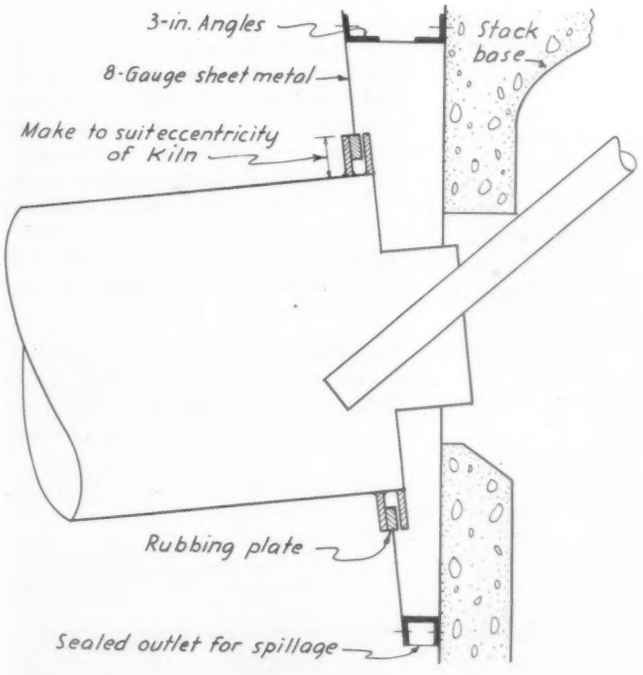


Figure 4.

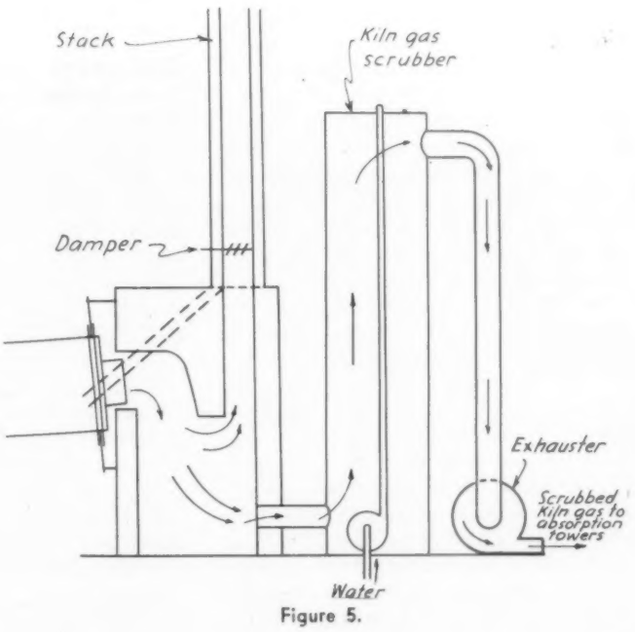


Figure 5.

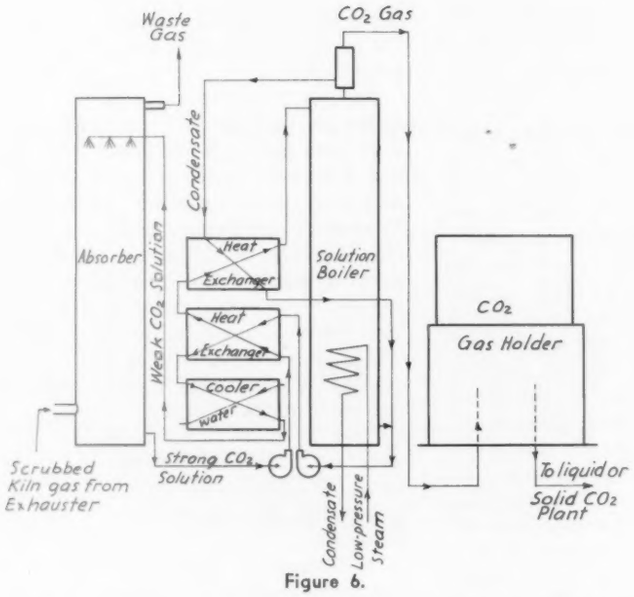


Figure 6.

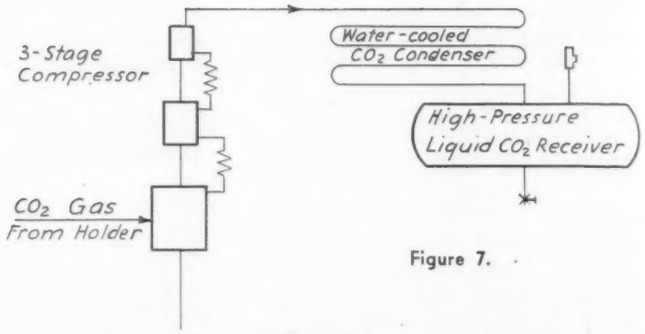


Figure 7.

gas in smaller equipment or less gas in larger equipment. It will probably prove economical, under these chosen conditions, to use some arrangement between these two extremes.

Thus, we may design an absorption tower to handle 26 tons of kiln gas per day of 24 hours and strip the carbon dioxide from it practically to completion, or we may design a smaller absorption tower to remove only 60 per cent. of the carbon dioxide and handle 43 tons of kiln gases per day of 24 hours. The deciding factor is the cost, maintenance and depreciation of the additional tower capacity against the cost of handling the greater quantity of kiln gases. And the richer in carbon dioxide the kiln gases are, the less the quantity that must be handled for the purification of the same ultimate quantity of carbon dioxide.

From Figure 2 we see that with 47 per cent. by weight of carbon dioxide in the exit kiln gas we must handle 30.5 pounds of kiln gas per minute to recover 10 tons of carbon dioxide per day by strpping or recovering all the carbon dioxide from the kiln gases. When the carbon dioxide is 33 per cent. by weight in the gases, we must handle 43.5 pounds of kiln gas per minute for the same result. Thus, under these conditions, the lower carbon-dioxide content of the kiln gas necessitates the pumping of 43.3 per cent. more gas than would be the case with the richer kiln gas.

Similarly, we can design smaller gas-purifying equipment and recover only 80 per cent. of the carbon dioxide from the kiln gas, if it is 41 per cent. carbon dioxide by weight, and get the same results as we would with the larger equipment with only 33 per cent. by weight of carbon dioxide in the exit kiln gas. Thus the importance of gas quality can be readily understood.

Commercial Carbon-Dioxide Processing The relatively pure carbon dioxide so produced must be further processed to be of commercial value. The form acceptable is either liquid or solid.

Liquid Carbon Dioxide.—This form is produced simply by compressing and cooling the pure carbon dioxide, so a compression-condensation-receiver unit will suffice for this purpose. Figure 7 shows the schematic arrangement of such a unit.

Solid Carbon Dioxide.—The manufacture of solid carbon dioxide is more complex and costly than the simple liquid method. In the making of solid carbon dioxide the gas is liquified as before; but it is subsequently cooled and expanded in the form of snow in the chamber of the snow press.

Equipment Installation Costs It might be mentioned here that the cost of installing a carbon-dioxide recovery system is high. Many are quite enthusiastic about the recovery of carbon dioxide until they find out what it is going to require in initial investment. Furthermore, each plant is a problem in itself and requires time, after completion, to get it into smooth operation.

There are certain advantages in considering unit equipment for this purpose. Thus the computations of engineering features are simplified and plant flexibility is insured. At the present time the smallest unit generally considered is the 10-ton per day unit. There is no good reason, however, for not going into smaller units except that equipment manufacturers seem to feel that the 10-ton unit is the smallest feasible commercial unit. In order to facilitate this part of the cost derivation, this same size, 10-ton, unit will be used.

Gas Purification The gas purification unit will be substantially the same for either the liquid or solid carbon-dioxide plant so that its cost can be fixed first. The elements of the gas-purification unit are as follows:

(1) Gas scrubber.
(2) Exhauster and motor.
(3) Absorption tower.
  (a) Solution.
  (b) Pumps and motors.
  (c) Solution storage tanks.
(4) Solution heat exchanger.
(5) Gas heat exchanger.
(6) Gas cooler.
(7) Solution cooler.
(8) Reboiler.
  Pumps and motors.
(9) Steam boiler.
(10) Gas holder.
(11) Duct, piping, electrical work.
(12) Erection.
(13) Royalties.

The approximate cost of this equipment, when purchased as a complete unit from the builders of this special machinery, will be approximately $80,000. It is believed, however, that this item can be substantially reduced by having the equipment made locally or improvising suitable adaptable equipment almost universally available around the lime plant. Many lime plants have well-equipped and manned machine shops wherein much of this equipment could be made.

Compression Liquifying Unit The compression condensation unit equipment for making liquid carbon dioxide consists of the following:

(1) Carbon-dioxide compressor and motor.
(2) Intercoolers.
(3) Carbon-dioxide condenser.
(4) Carbon-dioxide liquid receiver.
(5) Piping and electrical work.
(6) Buildings.

(*Continued on page* 86)

Trend to Portable Plants Explained by Economies Achieved in Operations

General view of portable plant and pit with Diesel-engine drive on truck in foreground.

another ON THE SPOT report

IN sections of the country where permanent plants can not economically produce the needed aggregates for highways, portable or temporary plants are the logical answer. In recent years most of the portable plants built have gone overseas with our fighting forces but some have been put in operation here for the maintenance of important farm-to-market roads. Such a plant was delivered on July 1, 1944, to Giannotti & Sershen of Ely, Minnesota. H. J. Giannotti, a civil engineer and F. J. Sershen, an experienced producer of aggregates, had been partners since 1935 in all kinds of contracting, including excavating, mining, stripping, blasting, bridge building, road grading, etc. Early in 1944 contracts were obtained for producing and placing the sand and gravel necessary for stabilizing 18 miles of County Highways No. 66 and 4 in St. Louis County. The Pioneer Duplex 38V portable screening, crushing and washing plant was purchased for the partners' first venture in aggregates production.

The material is being supplied from setups at three different pits. This keeps the maximum length of haul down to about 5 miles. When visited by the writer late in July, the plant was at its second location 25 miles southeast of Eveleth, Minnesota. About 40,000 cubic yards of material was to be supplied from this location.

This deposit contains a high percentage of silt and clay, most of which is retained in the finished product. The material averages about 50 per cent. sand and 50 per cent. gravel with some boulders up to 2 feet in diameter. The property is covered with trees and bushes and these, with the 1 to 1½ feet of overburden, are removed by a Caterpillar D7 tractor equipped with a La Plant-Choate bulldozer.

The sand and gravel are dug from a 15-foot bank by a 1941 model American Gopher ¾-cubic yard gasoline shovel. This machine has crane and dragline attachments and will be used as a dragline in its next location. The shovel loads the material direct into an 8-cubic yard hopper over which is an 8-inch sloping grizzly. A reciprocating-plate feeder discharges the minus-8-inch material from the hopper on a 24-inch by 40-foot inclined belt-conveyor. This conveyor is swiveled

By W. E. TRAUFFER

Another view of portable plant showing screen and crushers.

The ¾-cubic yard gasoline shovel loading into hopper of plant.

to swing in an 180-degree arc so that the plant needs to be moved only at infrequent intervals. This discharges the material on the bottom deck of a 4- by 10-foot Pioneer 3-deck screen which does all the sizing.

When making the present ¾-inch minus road material, the bottom and the top decks are equipped with ¾-inch wire cloth and the middle deck is a blank steel plate. The 3-to 8-inch oversize which comes off the bottom deck drops into the 9- by 36-inch Pioneer anti-friction-bearing jaw crusher. The minus-2-inch product of the crusher is carried on a 24-inch by 20-foot belt conveyor to a 24-inch by 35-foot return belt-conveyor. From the latter conveyor this material is discharged on the top deck of the screen.

The plus-¾-inch material coming off this deck drops into a Pioneer double-roll crusher with 30- by 18-inch diameter rolls. The minus-⅝-inch product of this crusher is carried on the same series of 2 belt conveyors back to the top deck of the screen.

The minus-¾-inch material falling through the top deck of the screen slides down the blank center deck and drops with the same sized material through the bottom deck into a collecting hopper. A 24-inch by 20-foot swiveled belt-conveyor discharges this ¾-inch road material into dump trucks for delivery to the job. Most of the product is hauled in county-owned trucks.

When sand and gravel are to be produced separately a split bottom deck is installed on the screen and both compartments of the collecting hopper are used. The capacity of the plant varies between 60 and 100 cubic yards per hour in this deposit, depending on the amount of crushing necessary. The entire crew consists of five men including the two partners.

The entire plant is driven by a Caterpillar D13,000 engine mounted on a Mack truck. This drives the jaw crusher direct through a flat belt. The roll crusher and screen are flat-belt-driven from the crusher.

The plant, except for the hopper and the feed end of the first conveyor, is supported on the plant chassis which is mounted on 3 axles. The 2 rear axles are equipped with hydraulic brakes and have equalizers which keep the plant level on rough ground or in transit.

Carbon Dioxide *(from page 84)*

This equipment, new, will cost approximately $25,000.

The total investment in the liquid carbon-dioxide plant will thus total approximately $100,000 for a 10-ton per day unit. Approximately 200 electric-motor horsepower will be required. One man per shift can operate the plant, or three men per day. Thus an approximate table of operating or manufacturing costs can be set up for an annual production of 3,000 tons of liquid carbon dioxide.

LIQUID CARBON-DIOXIDE GAS PURIFICATION PLANT

	Cost per Ton
Interest on investment (6% of $100,000)	$ 2.00
Depreciation (20 years)	1.67
Power (375 kw.-h. per ton @ 1 cent)	3.75
Fuel for steam (@ 30 cents per 1,000 pounds steam)	1.03
Labor (3 men @ $6 per day)	1.80
Maintenance and supplies	1.50
Taxes, insurance, etc.	1.00
Miscellaneous	1.00
Total manufacturing cost of liquid carbon dioxide	$13.80

Solid Carbon-Dioxide Plant The solid carbon-dioxide plant unit for 10 tons per day consists largely of the following:

(1) 2-stage carbon-dioxide compressor and motor.
(2) Ammonia compressor and motor.
(3) Intercoolers.
(4) Ammonia-cooled condenser-receiver.
(5) Liquid carbon-dioxide coolers.
(6) Gas driers.
(7) Snow press.
(8) Storage facilities, scales, etc.
(9) Buildings, electrical work, etc.

The approximate cost of this equipment is $60,000 and the power required is approximately 250 horsepower. One man per shift can operate the plant proper with an additional man as helper during the day.

Thus, the operating cost of the entire gas-purification and solid carbon-dioxide unit of 10-ton per day capacity for 3,000 tons per year will be approximately:

SOLID CARBON-DIOXIDE GAS-PURIFICATION PLANT

	Cost per Ton
Interest on investment (6% of $140,000)	$ 2.80
Depreciation (20 years)	2.34
Power (630 kw.-h. per ton @ 1 cent)	6.30
Fuel for steam (@ 30 cents per 1,000 pounds steam)	1.08
Labor	2.30
Maintenance and supplies	2.50
Taxes, insurance, etc.	1.20
Miscellaneous	1.00
Total manufacturing cost of solid carbon dioxide per ton	$19.52

Whether or not these costs are high depends upon the price that can be had for the product. Ordinarily the wholesale price of solid carbon dioxide is about 2 cents per pound, or $40 per ton. On this basis the profit, therefore, will be approximately $20 per ton or on an annual production rate of 3,000 tons per year,

$$\frac{\$60{,}000}{\$140{,}000} \times 100 = 42.8\%$$ on the original investment.

Thus, it appears that there is a definite field for the recovery of carbon dioxide by lime plants.

Now Mining Underground at Seven of Kentucky Stone's Nine Properties

General view of the crushing plant at Russellville. Truck loading agstone under bin.

Face of quarry showing the three mine entrances.

another ON THE SPOT report

THE Kentucky Stone Company provides an outstanding instance of the growing trend toward underground mining operations in the crushed-stone industry. Of the nine plants owned and operated by this large producer all but two are now engaged in underground mining. When the plant at Russellville, Kentucky, was taken over from the old Kentucky Consolidated Stone Company in 1936, the operation was still being carried on in an open pit despite the handicaps of more than 20 feet of overburden and the presence of a 6-foot seam of soapstone about 80 feet above the floor of the quarry.

By WILLIAM M. AVERY

By 1938 the new owners had commenced driving entries into the face of the quarry, which is about 150 feet from floor to ground surface and approximately 500 feet wide. To-day there are three entries and the system of rooms and pillars, all roughly 50 feet square, extends back from the face about 1,200 feet and fans out to a width of 1,000 feet. After the final top is brought down the roof stands 54 feet above the floor.

Two special Sullivan wagon drills, designed for the Kentucky Stone Company (and for this reason designated by the manufacturer as type KSC), are used for drilling in the mine. Employing standard slides and drills, these units, by virtue of their unique frame design, make it possible to drill in very close to the side walls eliminating the step-outs necessary when conventional drill frames are used. Compressed air is supplied to the mine by a motor-driven Chicago Pneumatic compressor having a capacity of 600 cubic feet per minute and located at the crushing plant some 1,700 feet from the present working face. The compressor supplies a 6-foot diameter by 18-foot receiver set up in the mine, and all air-operated equipment below ground is supplied by the receiver. The blasting is done with Hercules and du Pont powders using electric caps for detonating.

After blasting, the rock scattered over the floor of the room is shoved together in piles by an RD7 Caterpillar tractor bulldozer to the minimum height of about 4 feet. This practice expedites the work of recovery later, since it increases both shovel and truck efficiency in loading out. The recovery from the back rooms at some distance from the entries is accomplished with a Bucyrus-Erie 20-B, ¾-cubic yard shovel which has been converted from gasoline to electric power. A 19-B, ⅝-cubic-yard gasoline shovel of the same make is used occasionally in the front rooms which are close enough to the entries to assure adequate ventilation. Six Mack and White dump trucks make the 1,700-foot haul from the back of the mine to the crushing plant located at the edge of the pit.

Special KSC wagon drill working in mine.

At the Russellville plant the practice has been to bring down the top rock through the winter months. A special portable rig developed and built at the plant is used for drifting the roof. It consists of a working platform about 16 feet above floor level supported by a framework of 4- by 4-inch timbers mounted on a Mack truck chassis the cross members of which have been lengthened to about 6 feet. The slide consists of a 4-inch pipe frame 20 feet long above the working platform. The feed and drifter are Sullivan IW-6 and TV-10-B machines respectively.

The trucks dump directly into an Allis-Chalmers 20-inch Superior McCully gyratory crusher. From the primary crusher the stone drops to a Link-Belt 36-inch wide inclined bucket elevator on 60-foot centers, by which it is elevated to a Simplicity 4- by 12-foot triple-deck scalping screen. The somewhat unique employment of a 3-deck screen for scalping makes it possible to shift the plant almost instantaneously from one primary size to another. (There are three primary sizes of stone produced: 1-inch, 1½-inch and 2½-inch.) Hinged steel doors, installed at the ends of the screens and operated by outside levers, direct the flow of stone over the particular screen required.

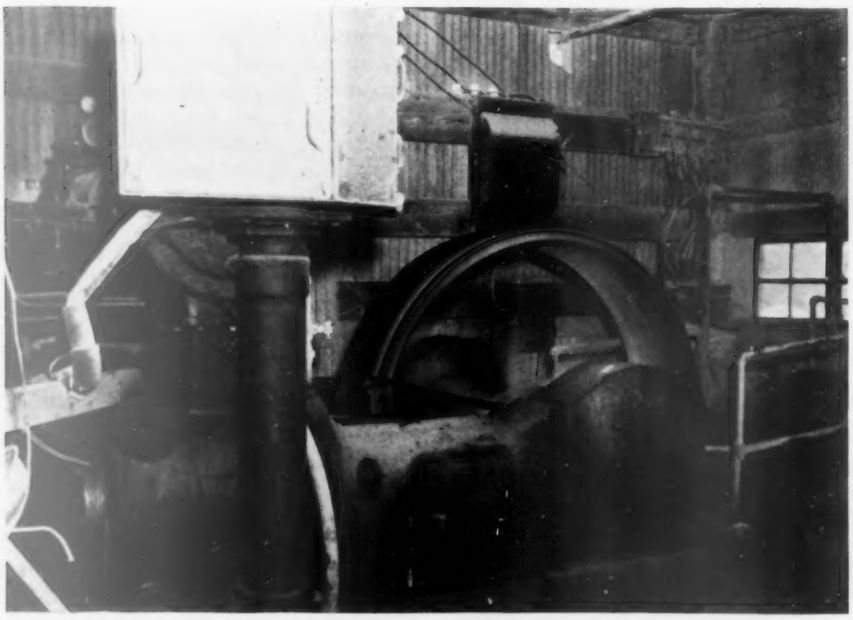
Pulverizer used on agstone production.

One of the bucket-elevators.

The oversize material from the scalping screen drops through a chute into a Symons 4-foot standard cone crusher which discharges it into a Link-Belt 30-inch wide bucket-elevator on 60-foot centers. The material that passes the scalping screen drops into a steel hopper and is fed to the same elevator, which discharges on a Telsmith 5- by 10-foot triple-deck Pulsator screen. The top, middle and bottom decks of this screen are 1-inch, ½-inch and ⅛-inch mesh. A 16-inch by 34-foot belt-conveyor takes the oversize from this screen to a Gruendler 3XB pulverizer from which it is returned to the screen in closed circuit by means of a Link-Belt 14-inch wide inclined bucket-elevator on 50-foot centers discharging into the 30-inch elevator.

Spreader weighing out on 20-ton platform scale.

All the stone passing the 5- by 10-foot screen drops on a Telsmith 4- by 8-foot triple-deck Pulsator



The 600-c.f.m. compressor. Note filters on the intake.

The 4-foot cone crusher, with truck dumping to primary crusher in background.

screen for a final cleaning. The top, middle and bottom decks are ⅜-inch, ¼-inch and ⅛-inch mesh, and both the oversize and the undersize flow directly into bins.

The main bin is 36 feet square and 14 feet high, partitioned into six 12- by 18-foot compartments with a capacity of about 90 tons each. The 3 compartments on one side of the plant can be used to feed a second Gruendler 3XB pulverizer by means of a 16-inch by 36-foot belt-conveyor below the bins. From the pulverizer the agricultural limestone drops to a Link-Belt 12-inch by 54-foot high vertical, inclosed bucket-elevator, which discharges into a seventh bin at the end of the plant. The agstone bin is 18 feet square and 14 feet high.

It should be noted that the first Gruendler pulverizer in the flow is actually functioning as a secondary crusher for making fine rock (below ¾-inch) for road surfacing, although about half its production is agstone. This results because the capacity of the present cone crusher

The 20-inch primary crusher.

is less than the volume of minus 1-inch material being fed to it. If both the Gruendler pulverizers were used wholly to produce agricultural limestone an increase of only 100 tons per day would result. Thus, although the agstone capacity of the plant is around 600 tons per day, it is not feasible at present to produce much more than 500 tons per day.

The Russellville plant produces about 900 tons per day of railroad ballast and road stone. (Note that all the tonnage figures are for a 9-hour day.) About 35 per cent. of its production is shipped by truck and the remainder by railway. Agricultural limestone is shipped principally to Simpson and Logan counties, but through redistribution it reaches five counties in all.

At present about 30 men are employed in the operation of the mine and plant. Ed Williams is superintendent.

Bulldozer bunching up rock scattered by blast at mine face.

Synthetic Rubber Has High Abrasion Resistance

At the sand pits and stone quarries or at the kilns, abrasion is meeting a tough foe in special-purpose synthetic rubber. Whether it is on rubber-tired equipment, conveyor and transmission belts, air lines for pneumatic tools or the dozens of other places rubber is used around machinery and equipment, some rubber manufacturers say synthetic rubber never will be replaced by the natural product.

"An abrasion resistance 50 per cent. greater than that of natural rubber is just one of the reasons why synthetic rubber is here to stay," John A. Tallant, manager of the technical data service for Hycar Chemical Company, Akron, declares. "Operators of equipment driven by crawler tracks will recognize the advantage of this superior resistance to abrasive action."

Other superiorities of the man-made product are better resistance to high temperatures and resistance to oils and chemicals which cause natural rubber to deteriorate quickly.

These qualities alone, and in combination, make longer-lasting products, whether they are belts, hose, gaskets, packings, electrical cable insulation jackets, or whether they are used in connection with crushing or conveying machinery, power shovels or pumping equipment, Mr. Tallant points out in discussing the future of synthetic rubber.

"Certain machinery must be mounted on rubber to lessen vibration and cushion shocks. Since synthetic rubber has the ability to absorb impacts rather than reflecting them, as does natural rubber," he says.

A.I.M.E. Western Non-Metal Meeting Features Block-Caving, Flash Drying

another ON THE SPOT report

By HARRY UTLEY

THE American Institute of Mining and Metallurgical Engineers met in the Ambassador Hotel, Los Angeles, on October 19 and 20 for its fall meeting. Both the Industrial Minerals and Petroleum Division were represented with separate sessions for each. The gathering was the first of this nature to be held on the Pacific Coast since 1938 and so successful was its outcome that the Southern California Section of the institute has determined to make the meeting an annual event in the future.

Caving in Limestone Mining

Many of the thirteen papers presented at the technical sessions of the Industrial Minerals Sessions were of particular interest to PIT AND QUARRY readers. Of paramount interest, perhaps, was the description of *A New Caving Procedure at the Crestmore Limestone Mine* by R. H. Wightman, mine superintendent of the Riverside Cement Company, Riverside, California. For a number of years the Riverside company obtained its raw materials by surface quarry operations but after these deposits were exhausted for the equipment available at that time, the company started underground mining. Workings were begun in the period 1927-1930 for the recovery of stone by block-caving methods.

The stone is a metamorphosed and recrystallized limestone generally white in appearance. The bed is fissured by water courses and cracked by instrusions along the footwall and hanging wall. These walls are a coarse-grained, gray quartz granodiorite. The bed is approximately 1,700 feet long and tapers from 270 to 100 feet in thickness.

The mine consists of four main levels. The 800-foot level is a manway level used for ventilation, prospecting, and as an entrance to the stopes. The 700-foot level is the mining level where all the material is extracted and on which are located the tapping grizzlies. At 660 feet is the haulage level, where the stone is drawn from the transfer rises into cars and transported to the tipple by electric locomotives. The 633-foot level collects the water and keeps the general water table below the working levels.

The first blocks to be caved were developed after the procedure used in the copper mines of Arizona. Mr. Wightman's paper dealt with the ninth block to be so caved. With a hard, tough rock, such as is encountered at the Crestmore mine, it was found that some alterations in the development and control of the draw in caving were necessary to secure a better crushing effect and to provide safer working conditions for such secondary blasting as is required.

The sequences of block development are as follows:

1. The fringes of the 800-foot manway level are driven to conform to diamond-drill information and determine the final location and development required for the block.
2. The haulage laterals on the 660-foot levels are driven, at 70-foot centers, off the main haulage drift.
3. Rises are then started from the haulage level at 35-foot centers and draw sets are installed. From the draw positions on the haulage level three rises are driven to connect with the mining drifts above at the proper positions.
4. Mining drifts on the 700-foot level are then driven at 35-foot centers.
5. While the primary development is nearing completion, rises for stope ventilation and for handling supplies into the stope from the 800-foot level, or from the surface, are driven from the 700-foot mining level to the surface, or to the 800-foot level if the stope is in the hanging wall.

In the ground of the Crestmore mine it is necessary that the block be completely cut off on all four sides. At least two cribbed runways are carried up the stope advance in all the stopes. These are recessed on one side of the stope in order to prevent "crawling" of the cribbing during shrinking of the stope. All the stopes are worked as shrinkage stopes and it is general practice when driving to drill and blast about one-half a stope at a time so that one manway is available for entrance to the stope. Fuse and caps are generally used in blasting but, when the ground requires it, electric blasting is used for safety. When completed, all the stopes are left full of broken rock until caving of the block is undertaken.

The success of caving a block requires extreme diligence in the undercutting procedure. After it has been decided to bring in a block, the undercut stoping is begun. Experience, Mr. Wightman declared, indicates that it is desirable to cave this ground by retreating from the footwall side to the handging wall side of the block. It has been found necessary to blast thoroughly, and completely remove the pillars in order to obtain successful caving of the block and care is exercised to see that no pillars are left between the ends of the stopes and the adjoining caved area of previously-caved blocks. Earlier caving procedure proved that if the pillars under too large an area were blasted at once, there was a tendency for the entire undercut area to drop, thus eliminating the benefit of the desired g e n e r a l fragmentation throughout and making necessary an additional undercutting operation. The new procedure, in beginning an undercut, is to complete at least the first three stopes as well as the holes for the removal of all the pillars. This sequence is carried out throughout the entire block. Stopes are advanced on either side of each tapping drift as a pair, cutting openings in the intervening pillars as a means of entry.

As the pillars are blasted and the overhang develops, the caving begins. Slabs of stone begin to spall from the bedding planes and soon fill the space left between the broken stope rock and the mass above. When this occurs, just enough broken rock is drawn to keep the spalling action working on up toward the surface. If drawn too fast, this area will tend to shear perpendicularly to the surface without securing the desired fragmentation. If no broken rock is drawn from the area and the mass is allowed to settle on the broken stope rock until all the pillars in the block are removed, excessive weight is placed on the tapping drifts directly below the area. The mass may then become so compact that it will have to be

partially undercut again in order to start working.

Judgment as to the control of the draw under the caved area is based upon observation of the fragmentation of the unsupported mass, largely by sound, and by observing the weight being taken by the first uncaved pillar. Should the draw be made too fast, the speaker emphasized, this pillar will show signs of compression failure.

Successive pillars are removed and the draw principle mentioned is continued until all the pillars under the block have been removed. After removal of all the pillars the maximum fragmentation that can be obtained has been accomplished. At this point is begun what the speaker called "rocking the block" for the purpose of securing a maximum of crushing action of the large rock fragments in the mass. This is done by controlling the draw so as to shift the strains and stresses throughout the mass by changing the locations carrying the weight. The draw is concentrated at points of poor fragmentation where it will tend to create both compression and tensile strains. As fast as such areas are observed, the draw is changed to create a continual rocking of the entire broken mass with the view of keeping the whole area down on the pillars and not allowing any area to "hang up" or create large cavities.

The broken stope muck in the main cut-off stopes is drawn only sufficiently to provide additional room for the expansion of the block proper as crushing progresses and additional space is required for expansion. As the draw progresses, an effort is made to maintain as nearly as possible an even draw throughout the block. The main objective, Mr. Wightman said, is to control the draw so that the entire block will be kept down on the pillars where it is both economical and safe to work. As an indication of the safety to workers of the present caving procedure, the speaker pointed pridefully to the fact that the mine has operated three successive years without a single lost-time accident!

After a block has been caved, the granodiorite overburden breaks down into fines and the continuous rocking of the limestone tends to prevent the detrimental funneling of this overburden. Although about a 20 per cent. dilution is required in the manufacturing process, this material can more easily be secured from the older blocks and thereby provide the maximum recovery of stone.

After a block has been caved it is drawn completely and without interruption for maximum economy and efficiency. Should it be allowed to remain idle for any length of time, the mass will become packed and much time and effort will be required to start it working again.

About 10 per cent. of an entire block is broken in the main cut-off and undercut-stoping operations at Crestmore and about 30 per cent. of the stone is further reduced in size by secondary blasting to insure its passage through the tapping grizzlies on the mining level.

Blocks 270 by 310 feet in size with a maximum height of 180 feet have been caved successfully, said the speaker, in concluding his paper.

Grinding *Flash Drying and Grinding as Developed from Mill Drying* was the subject of another interesting technical paper presented by William B. Senseman, Raymond Pulverizer Division, Combustion Engineering Corporation. Mr. Senseman has been Raymond's sales engineer on the Pacific Coast for a quarter of a century and has contributed much to the technique of dry grinding and air separation as well as flash grinding in many processing plants. His contribution consisted almost entirely of slides showing typical installations of his company's equipment which traced the development of the utilization of hot gases to remove moisture during grinding and separation.

In Mr. Senseman's opinion, flash drying has wide possibilities especially when used on materials requiring close temperature control, in drying materials which can be injured by prolonged exposure to heat or gases, and for removing surface moisture without releasing combined water necessary in hydration, such as with synthetic gypsum. It can not compete, he admitted, on a cost basis with rotary driers and calciners where these machines do a satisfactory job. In general, the product being flash-dried should be finer than 30-mesh. It is the ideal means of drying materials which may stick or burn when dried by any other method and for producing products requiring a uniform and constant moisture content.

Vent temperatures as high as 380 degrees F. have been used successfully in flash drying, but Mr. Senseman predicted that much greater heats may be employed in the future if the development of high-temperature steels continues at the pace set in recent years. And experiments now being conducted, he hinted, use ceramic construction in the high-temperature zones, pointing the way for future calcining temperatures as high as 2,000 degrees!

Samuel H. Dolbear, prominent consulting engineer in industrial minerals, made a brief talk on the industrial-mineral resources of China. He reviewed some of the vast, undeveloped reserves that exist in that country, many of which are still unknown and unestimated. China will be in an excellent position to utilize these reserves in the post-war period and he intimated that the country will necessarily require the assistance and knowledge of American technologists in their development. Suitable transportation from mine to market will be the first necessary step and the construction of roads, bridges and railroads in itself will provide an important initial market for China's nonmetallic minerals in the form of Portland cement, sand, gravel, asphalt, lime, gypsum and other products.

Minerals for the Chemical Industries Industrial minerals are the principal raw materials of the chemical industry and the mutual interdependence of the two industries is considerable, pointed out Herbert Waterman, acting head of the department of chemical engineering at the University of California in his paper titled *Industrial Minerals and the Chemical Industry.*

"This technical interdependence of the two industries has continued to increase as the years go by", Prof. Waterman reminded his listeners. "In the early days of the mineral industry only rich ores or relatively-pure minerals were produced and used, requiring the minimum of processing generally limited to physical separation. Now the dumps of many of these early operations are being further processed, thanks to the chemical industry, and made to yield valuable products.

"Since chemical processing, as distinguished from the direct utilization of minerals as they are mined, appears to be on the increase, it seems desirable for the mining and metallurgical engineer to be familiar with some of the background of chemical engineering. Similarly, the great importance of industrial minerals to the chemical industry suggests that the chemical engineer should know more about minerals, their sources and availability than he is likely to know now. Engineering schools should consider the inclusion of courses in industrial min-

erals in the chemical-engineering curriculum, while the mining-engineering curriculum may well include courses in physical and industrial chemistry and in unit operations and processes.

"The slow but certain transformation of the mineral and chemical industries from an art to a science, based soundly on our current knowledge of molecular structure, thermodynamics, and chemistry promises a brighter future for both industries. Their growth is assured by their indispensability to our civilization. In the future, as in the past, their mutual interdependence is bound to benefit both industries."

Fluorescent Minerals *Fluorescent Minerals Used in Lighting and Elsewhere,* a paper prepared jointly by Oliver C. Ralston, chief of the industrial-minerals division of the U. S. Bureau of Mines, and A. George Stern, chemical engineer, Westvaco Chlorine Products Company, was read by Mr. Stern. Although the quantity of minerals used for fluorescent purposes is small and probably will continue to be so, this use is significant because it exemplifies a requirement for "pure" minerals in which a trace of contaminant as minute as 1 part in 10,000,000 parts may be the deciding factor between the acceptance or rejection of a particular material. The extreme purity makes synthetic minerals almost essential and natural Stern reported.

Besides its use in lighting, fluorescence is of growing interest to the mineral industry because certain minerals may be detected thereby. Another paper, *Spectro-Chemical Analysis of Industrial Minerals* by Maurice Hasler of the Applied Research Laboratories covered this subject quite thoroughly.

Steel-Making W. F. Dietrich of Dietrich, Morse & Associates read an interesting paper entitled *Specifications and Sources of Nonmetallic Raw Materials Used at the Fontana Steel Plant* written by Charles Severy, Raw Materials Department, Kaiser Steel Company. Mr. Severy was just recently called to duty in the United States Navy and could not be present.

The limestone is used as a flux in both blast and open-hearth furnaces. A medium-coarse crystalline rock is employed, although a denser stone would be preferable. Less than 1 per cent. of silica in the stone, is desired, not more than 5 per cent. of magnesia, the sulphur content is limited to .1 per cent. and the phosphorous content to .05 per cent.

Stone for the Fontana blast furnaces is crushed to about 1½ by 4 inches in size and comes from the quarries of the California Portland Cement Company at Colton, 9 miles south of the steel plant. The monthly requirements total about 16,000 tons. The open-hearth stone is quarried at Amboy, California, a point in the Mojave Desert about 150 miles east of the Fontana operations. Chunks about 5 by 8 inches in size are shipped.

Dolomite, about 1,000 tons of it per month, is crushed to chip size (⅛ by ⅝ inches) at a plant at Salinas, California, owned by the Permanente Metals Corporation, another Kaiser subsidiary. Both raw and burned dolomite are available.

Although seldom used in eastern steel plants, fluxing clay is used to a great extent in the big Fontana plant to increase the alumina content of the slag. The clay, with an alumina content of 20 to 25 per cent., is dug in Riverside County, the pit being about 30 miles away from the steel plant.

About 200 tons of fluorspar is also used monthly in the open-hearth furnaces. A special loam used in furnace bottoms is shipped all the way from Pennsylvania, about 175 tons being required in a normal month. Fifty tons of refrectory sands is also shipped to the plant monthly from a pit in Orange County, California. About 150 tons of molding sands is required in a normal month, much of it being mined in Nevada.

Talc Steatite talc, a talc of exceptionally high purity, was placed on the critical list in 1941 by the War Production Board and is used almost exclusively for the manufacture of high-frequency insulators in military radio and radar units. Before that time the only known deposit was at Talc City in Inyo County, California, explained Ben M. Page, associate geologist with the United States Geological Survey in his paper *Steatite Talc—Geology of Some Domestic Deposits.* The Inyo County workings have been supplying the bulk of the requirements but other mines have been opened in Nevada and New Mexico in the last year or two. The material occurs, for the most part, as lenses in limestone, dolomite and granite faults. The Palmetto-Oasis area in Nevada is now second in importance as a source of this material.

Lithium, little known and little utilized before the present war, although discovered in 1817 by a Swedish scientist, is being produced on the largest scale in history at the present time, according to Lawrence Roe of the American Potash & Chemical Corporation, who read a brief paper on the subject. Like magnesium, lithium is a light-weight metal derived from a so-called nonmetalic ore.

Ore for Magnesium Charles J. Vitaliano, United States Geological Survey, talked on the deposit at Gabbs, Nevada, which supplied the raw material for the huge plant of Basic Magnesium, Inc., which is now preparing to halt operations because of a surplus of the light-weight metal. Nine separate open-pit operations were worked in the Gabbs area, both by Basic and by the Sierra Magnesite Company, the latter concern shipping the ore without processing to plants in various locations. The Gabbs area was thoroughly mapped by the Geological Survey in co-operation with the Nevada Department of Mines about a decade ago but not until the present conflict was any material taken out for processing. The ore body is the largest and richest within the continental limits of the United States and Mr. Vitaliano is confident that its existence spells a post-war opportunity for alert-minded operators. In his opinion there is still approximately 1,800,000 tons of good ore to be taken out with at least 3,500,000 tons of medium-grade material awaiting utilization.

Eugene Callaghan, also with the Geological Survey, discussed some structural features of California's best-known vein-type magnesite deposits. Located in the Red Mountain district about 30 miles southeast of Livermore, the district has mined more than 1,000,000 tons of magnesite since it was discovered in 1905. There are five distinct deposits occurring here in a wedge-shape area. The richest deposits are found in shear zones, the magnesite having replaced serpentine during mineralization in most cases. Fortunately, the best grade of material is found near the surface, none of the workings exceeding 400 feet in depth. The operations of the Sierra Magnesite Company in this deposit were discussed in the April, 1937, issue of PIT AND QUARRY.

The two-day session closed with a dinner in the Embassy Room at the Ambassador on Friday evening, October 20. E. G. Trostel, chairman of the Southern California Section of the Institute, presided.

Columbia Quarry Ups Capacity to Meet Huge Demand for Agstone

By
WILLIAM M. AVERY

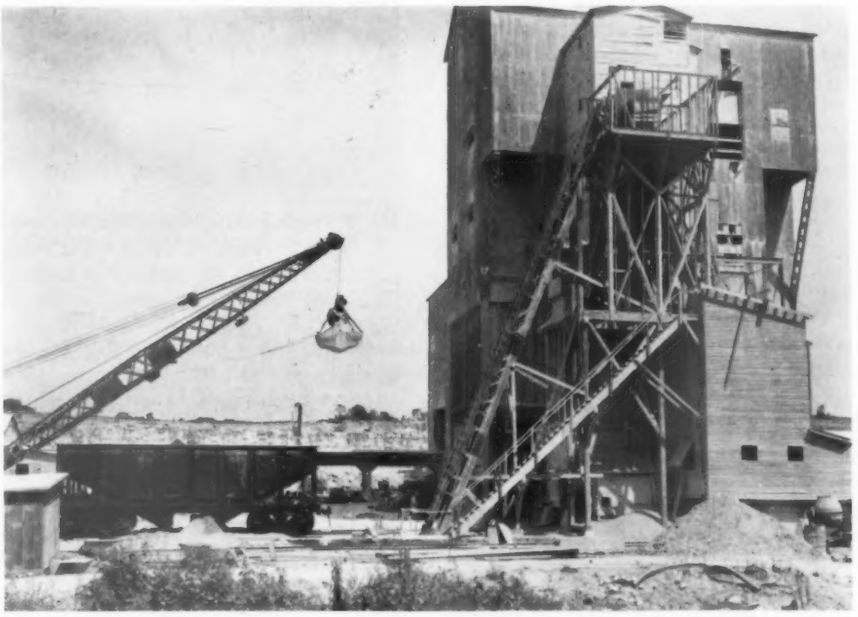
another ON THE SPOT report

THE booming market for agricultural limestone throughout the state of Illinois has thrown an unprecedented strain on the capacities of existing plants, and producers generally have endeavored to meet the challenge by wringing every possible ton of production from the equipment on hand. In those plants, however, in which operational efficiency had always been maintained at a high level, no material increase in production could be hoped for without the installation of new facilities. A case in point is the Columbia Quarry Company's plant at Krause, Illinois, where early in August new handling and pulverizing equipment was placed in operation to increase the production of agricultural limestone to about 3,200 tons per day.

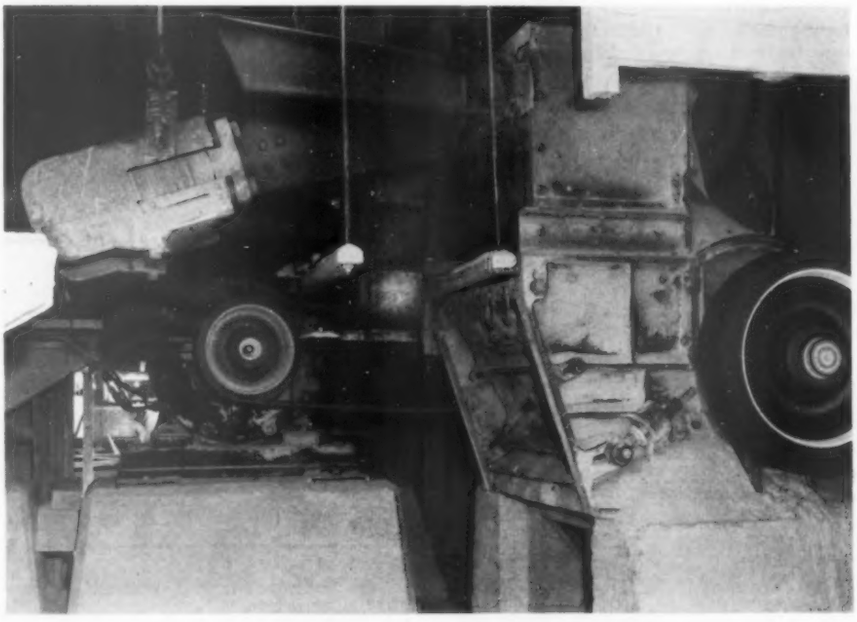
With the new arrangement of the pulverizing plant, minus 2-inch stone is brought in from stock-piles in hopper-bottom cars and dumped into a 9- by 26-foot steel track hopper. Through four 18- by 18-inch rack-and-pinion gates in the bottom of the hopper the material flows by gravity onto a 24-inch wide by 28-foot-long pan-conveyor which has a capacity of 200 tons per hour at a speed of 55 feet per minute. The pan-conveyor feeds a 24- by 10-inch inclined bucket-elevator (82 feet from head shaft to tail shaft), which raises the material to the top of the pulverizing plant. The capacity of the elevator is 200 tons per hour at a speed of 230 feet per minute. The Stephens - Adamson Manufacturing Company designed and furnished the track hopper, pan-conveyor and bucket-elevator, which are part of the recently completed revamping and expansion program.

Auxiliary stone feed comes into the pulverizing plant over belt-conveyors directly from the adjacent crushing plant, which also produces the minus-2-inch material for stock-piling. With two relatively independent methods of supplying the pulverizing plant the maximum of operating flexibility has been achieved, and either plant could be shut down for a considerable period without drastic effect upon the other.

Three steel bins at the top of the plant, one of 200-ton and two of 75-ton capacity, feed the stone by gravity to Syntron electric vibrating feeders. When the original pulverizing plant was built in 1926, one type ACS-3 American pulverizer was installed, with a Syntron 36- by 60-inch vibrating feeder handling stone from the 200-ton bin. Later (in 1937) an American 30.40 pulverizer was installed with a 30- by 42-inch Syntron feeder and a 75-ton Butler bin. The new pulverizing



General view of pulverizing plant. Car is dumping into track hopper. Main crushing plant is in the background.



Pulverizer with a 30- by 42-inch vibrating feeder above.

equipment installed this year duplicates the original 1926 installation with the exception that a 75-ton bin supplies the new 36- by 60-inch Syntron feeder.

To prevent choking in the pulverizers and to simplify later handling of the finished product, the feed stone is dried somewhat by means of coal fires which are kept burning constantly under each of the feeder pans. Although the amount of moisture removed by this method is relatively small, it is sufficient for the

Track hopper and the 24-inch by 28-foot pan-conveyor.

purpose. Electric heating units will soon be installed to eliminate the nuisance of firing the braziers.

All three pulverizers discharge to a 24-inch Stephens-Adamson bucket-elevator, two of them directly through chutes and the third by means of a short, 24-inch General belt-conveyor. The bucket elevator, which is 90 feet from head shaft to tail shaft, discharges through a chute into the main crushing building, where the material is screened over a 5- by 14-foot Ty-Rock double-deck vibrating screen, having 3/8-inch

One of the large pulverizers. Note coal brazier for drying feed stone.

mesh on the top and No. 5 mesh on the bottom. The material passing the screen is conveyed directly to storage bins, while the oversize may

The two-deck 5- by 14-foot vibrating screen for sizing material from pulverizer.

be returned to the pulverizers or stored if the size is in demand.

About 1,000 tons per day of the plant's agricultural-limestone production is shipped by trucks, which at present are loaded from the same bins that are used for railway shipments. To relieve congestion on the tracks and speed up loading, a 200-ton steel truck bin has been set up near the pulverizing plant and will be placed in operation in the near future. This bin will be loaded directly from the pulverizing plant by

View of the control panel.

means of a new Stephens-Adamson belt-conveyor now on order.

Of the anticipated 3,200 tons daily production of agricultural limestone at the Krause plant, approximately 800 tons will come from the main crushing plant.

The operations are under the supervision of E. A. Heise, who is plant superintendent.

● Your country is still at war, —are you?

The lime industry at St. John, N. B., continues handicapped by scarcity of male help. It has been found out of the question to maintain either the quarries or the plants at capacity production because of the inability to hire enough labor to make this possible. Sufficient lime cannot be produced to meet the demand and it is estimated that all the lime firms are behind at least 50 per cent. in filling orders, for both the quick and hydrated lime.

While practically every industry has been able to substitute females for males during the record scarcity of male help since the start of the war, the lime and gypsum industries have been unable to take advantage of the female labor. There is very little in the lime and gypsum quarries and plants that a woman or girl can be assigned to. There have been comparatively few instances in which operators of sand and gravel pits have used women and girls in loading trucks and wagons. They have proved so tempermental and inclined toward absenteeism, that such substitution has not been satisfactory.

Installation of more equipment is proceeding at the brucite properties of Basic Refractories, Incorporated, Luning, Nevada, operated in the Gabbs Valley district to expand production to 200 tons daily. George W. Nielsen, formerly on the technical staff of Basic Magnesium, Inc., is now general superintendent for Basic Refractories.

The company is shipping about 100 tons of brucite daily to its plant at Maple Grove, Ohio, for manufacture of furnace lining and various refractories. Large deposits of high quality material are reported available. The brucite properties are adjacent to magnesite mines formerly worked on a large scale by Basic Magnesium, Inc.

The El Rio Rock Company has acquired the plant and assets of the Santa Paula Rock Company of Santa Paula, California, and the plant will begin operations shortly under the management of O. P. Barker.

The Santa Paula plant, formerly owned by C. D. Woolsey, had been shut down for about six months. Since it was acquired by the El Rio concern, a crew of workmen has been busy making repairs and improvements.

Boston Section A.I.M.E. Stresses Production of Vital Non-Metals

Field Trip to Keene Mica Mines and Beryl Mountain a Feature

By W. E. TRAUFFER

another ON THE SPOT report

THE fall meeting of the Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers, which was held in coöperation with the Boston Section of the A.I.M.E. at the Statler Hotel, Boston, on September 27 to 29, was well attended, chiefly by members from the New England area. Many interesting papers were represented at the various technical sessions and the several special features were also well received. An informal get-together party and dinner was held at the Boston Yacht Club on September 28 after the final sessions were completed. The guest of honor and principal speaker was Chester A. Fulton, president of the A.I.M.E. and of the Southern Phosphate Corporation. In discussing the "Four Freedoms" Mr. Fulton made it apparent to all that, in spite of war-time restrictions, we are still the least restricted of all peoples. Harlow Shapley, astronomer, Harvard University, introduced considerable humor into a discussion of his specialty. Charles E. Locke, Professor Emeritus of Mining and Ore Dressing at the Massachusetts Institute of Technology, was toastmaster.

A special feature of this meeting was a field trip to the mica pegmatite district near Keene, New Hampshire, on September 29, which was also well attended. Many also stayed over the next day to visit the famous Beryl Mountain which is one of the most remarkable geological formations in the east.

The technical sessions were opened on Wednesday afternoon, September 27, with a discussion of *Corundum — A Vital War-time Abrasive* by R. D. Parks, vice-chairman of the Metals and Minerals Coördinating Committee of the W.P.B. Mr. Parks told of the important part this material has played in the war effort and of the government's efforts to develop adequate sources of supply for our war needs. The present output in this country now nearly meets our needs and new sources in this country and Canada will make us self-sufficient by the end of this year. Mr. Parks also commented on the fact that corundum has held its place as a specialized abrasive for glass and metal finishing in spite of the development of artificial competitive materials.

In the absence of Frank C. Hooper, vice-president of the Barton Mines Corporation, his paper on *Abrasive Garnet Operations in the Adirondacks* was read by Oliver Ralston of the U. S. Bureau of Mines. In his paper Mr. Hooper described the deposit his company operates at North Creek, New York, which is said to be the largest known and to contain crystals weighing up to 1 ton. He also described the various phases of the operation from drilling and blasting through gradation. The product is now sold for polishing wood before varnishing and in the next to the last stage in polishing glass. In normal times much jewel stone is also sold.

In *Fullers' Earth* H. L. King, formerly of the Attapulgus Clay Company and now with the Johns-Manville Corporation, described the mining and processing methods used in Florida and Georgia. One of the important processing developments in recent years is an extruder with a capacity of 30 tons per hour which eliminates much of the former waste and improves the product. One of the new uses for fullers' earth, according to Mr. King is as a substitute for sawdust on machine shop floors because of its superior oil-absorbing qualities.

A paper on the *Occurrence, Preparation and Properties of Quartz*, which was prepared by Carl Tolman and Robert D. Butler of the F.E.A. and Richard E. Stoiber, Office of the Chief Signal Officer, was read by Mr. Tolman. The Foreign Economic Administration, he said, has scoured the world but has found no other deposits of quartz crystals which can compare with those in Brazil. No substitute for quartz has been found as yet. In order to meet the demand for this vital war material, therefore, it was necessary for the few suitable deposits to be worked at maximum capacity and to eliminate any waste. As a result, he said, it is now possible to use quartz crystals weighing as little as 200 grams where the former limit was 500 grams. Improved production methods have also helped but the crystals must still be graded by hand. Slides were used to show the primitive mining methods and the modern methods which have replaced them.

R. B. McCormick of the Miscellaneous Minerals Division of the War Production Board described *The Manufacture of Quartz Crystal Oscillators*. He also told of the many ways in which quartz crystals are helping us to win this war by making possible improved equipment such as submarine detectors, tank radios, walkie-talkies, etc.

Raymond B. Ladoo, chairman of the meeting committee, then gave an unscheduled description of a new type of fused quartz which he says is the closest approach yet made to natural quartz crystals. This product, according to Mr. Ladoo, has a very low coefficient of expansion, transmits ultra-violet rays, is resistant to most acids, and has a high resistance to electricity at high temperatures and high frequencies. It can be made from rose quartz and from local quartzes and will soon be manufactured on a commercial scale.

In the absence of H. F. Kriege, technical director, France Stone Company Laboratories, his paper on *The Manufacture of Limestone Sand*, was read by another member at the Thursday morning session. After briefly describing the production methods commonly used Mr. Kriege pointed out some of the advantages claimed for this material over natural sand. These include: freedom from deleterious matter; accurate control of grinding; white color and low iron content; higher modulus of rupture in concrete; ideal bonding conditions and angularity in bituminous mixtures. He expressed his confidence in the future prospects for stone sand but pointed out that it must compete not only with natural sand but also

with agricultural limestone which can not always be made simultaneously. According to Mr. Kriege, most limestone deposits will make good stone sand as the chemical characteristics of the stone are not important if it passes physical tests. He also stressed the advantage to the stone producer of being able to bid on both the fine and coarse aggregates on a contract.

The paper on the *Quarrying of Dimension Stone Without the Use of Explosives* by Pierre de Vitry, manager, Patented Marble, Stone & Granite Machinery, was read by W. P. Mould, Rock of Ages Corporation. This paper traced the development of dimension-stone quarrying methods from wedges and slave labor to the present modern drilling and broaching methods. He also described the wire-saw method which, although widely used in Europe for all kinds of stone, is used in this country chiefly in slate quarries. Mr. de Vitry predicted that wire-sawing will become more popular in this country and suggested its use in many other places where the use of explosives would be hazardous or impractical, such as in mines, the demolition or cutting of concrete structures, etc.

In *Mining Optical Crystals,* a paper held over from the preceding day, G. Richards Gwinn, Nonmetal Economics Division, U.S. Bureau of Mines, briefly described various mining methods. He said that at least 13 minerals of 22 types had some of the qualities required for optical crystals but that only quartz meets the physical requirements for all purposes. Calcite and fluorite crystals, he said, can be used for certain limited purposes and producers should watch for these. Every fluorspar mine, said Mr. Gwinn, is a potential source of optical fluorite.

C. O. Campbell, mine manager of Canadian Industrial Minerals, Ltd., Walton, Nova Scotia, described the production of barytes by his company. Production was begun in 1941 at this deposit which is one of the largest known. The output that year was 20,000 tons but the plant has since been enlarged and improved to keep up with growing demands in this country. The output in 1944 is expected to exceed 120,000 tons. The sequence of operations, briefly, includes open quarrying, truck haulage, crushing, screening, wet classifying, grinding, etc. Improvements just completed have brought the capacity of this plant up to 180 tons daily in 23½ hours of operation. This plant is located on tidewater and the 60-foot tide makes boat loading possible only for two 1-hour periods daily.

Questioning brought out the fact that diamond drilling has proved more than 3,000,000 tons of ore but that the full depth of the deposit is not yet known. The plant improvements have increased the purity of the product before washing from an average of 94 to about 96 per cent. J. L. Gillson, who is also familiar with this operation, gave Mr. Campbell much of the credit for the improvement in quality and the increase in the output of this vital material. He also told why barytes has been so important in the drilling of oil wells.

S. Benedict Levin, mining engineer, U. S. Bureau of Mines, then briefly described the *Beryl Mountain Beryllium Deposits* which were to be visited on the field trip a few days later. This deposit, he said, is remarkable because of the unusually heavy concentration of beryl crystals found there. The largest crystal found there to date weighed 1½ tons.

Nature and Origin of a Highly Refractory California Clay was the title of a paper by T. F. Bates, School of Mineral Industries, Pennsylvania State College.

The technical session on Thursday afternoon was opened by W. W. Duecker, Texas Gulf Sulphur Company, with a paper on the *Common Forms of Sulphur in the World Markets.* He described briefly the methods of production in Italy and Japan where comparatively primitive methods are used and in Java where it is obtained from the craters of extinct volcanoes. Most of the finished product in these countries is in ingot form. These methods were in sharp contrast to those used in this country where the sulphur is usually recovered from deep deposits by means of hot-water wells and where the sulphur is settled out in huge outdoor vats or piles from which it is recovered in bulk by shovels.

Texas Celestite was the title of a paper by Glenn L. Evans, Bureau of Economic Geology, University of Texas, in which he described the formations in which this little known but vital material is found and the production methods used. As yet little is known about the full extent of the central Texas deposits which to date have produced over 10,000 tons. The mining of blanket deposits, which are said to be the only ones large enough for economical development, was begun in 1938, according to Mr. Evans. The first cavern deposit was opened in 1943. Celestite, he said, was originally used only for red railroad signal flares and the 2,000-ton annual requirements were shipped from England in bowlder form. Now much of the greatly increased demand is being supplied from Mexican deposits and some also comes from California. The native material, according to Mr. Evans, is inferior to the imported and efforts to use it as a substitute for barytes in drilling mud have not yet been fully successful. Mention was made of the fact that the Foote Mineral Company had ground some of the Mexican celestite for war needs at its plant in Philadelphia.

A paper on *West Texas Fluorspar* by Glenn L. Evans told of the development of mines in the Eagle Mountains near Van Horn. The U. S. Bureau of Mines first investigated these deposits early in 1943 and made many test drillings. These deposits are now being actively developed by the Western Fluorite Company.

Margaret Fuller Boos, U. S. Bureau of Mines, then read a paper on the *Exploration of Pegmatites in the Eastern United States.* She described the deposits, methods of exploration, development, etc., of various minerals vital to the war effort.

Some Geological Aspects of the Industrial Mineral Problems of New England were discussed by H. M. Bannerman of the U. S. Geological Survey. He first cited the work done in Illinois by various state bodies on the investigation and development of natural resources and said that many other areas need similar work. This war, he said, has convinced many that geological surveys are as important for the development of industrial-mineral resources as they are for metals. The work already done, said Mr. Bannerman, has not only developed additional sources of known minerals but has also uncovered materials which do certain jobs better than currently unavailable materials for which they have been substituted. He also stressed the importance of aerial surveys which have already been made by some states. Much remains to be learned about the industrial mineral deposits in New England he suggested a study of the talc deposits as one of the most important. Any work along these lines, he said, is also of value to those interested in soil conservation, highway construction, etc. Mr. Bannerman closed with the statement that the Survey's work must necessarily be national in scope and that local agencies must cooperate if any detailed study of natural resources is to be completed within a reasonable time.

Dover, N. J., Plant of National Gypsum Co. Ups Rock Wool Output Despite Handicaps

By WILLIAM M. AVERY

another ON THE SPOT report

BY acquiring in 1941 the assets of the General Insulation & Manufacturing Company, including plants located at Dover, New Jersey, Alexandria, Indiana, and Dubuque, Iowa, the National Gypsum Company has established itself as one of the major producers of rock wool in the country. At its Dover plant, which was placed in operation early in 1937 by the original owners, a particularly outstanding production increase per man-hour has been achieved despite an acute shortage of man power and the near impossibility of obtaining new equipment.

The plant is ideally located with respect to basic raw materials. In the vicinity of Dover there are a number of large slag banks created by the numerous smelting plants that have been operated in the locality. Both limestone and silica of suitable quality are quarried locally, and coke is readily obtainable. These materials are all purchased from outside suppliers and brought into the plant by highway and railway. They are checked constantly by analysis in the plant's own laboratory.

From large stock piles in the yard the materials are loaded into dump trucks by a General Excavator gasoline shovel, and are then transported into the plant proper and dumped into a receiving hopper. The various raw materials are raised by a Link-Belt elevator to 7 overhead storage bins having a total capacity of 500 tons. A swivel selector chute at the top of the elevator directs the flow into the various bins.

Port of cupola where molten slag is being blown from furnace into two streams with a blast of live steam.

The materials are accurately weighed in a Kron track scale which runs on a monorail above the cupola charging floor, and is so arranged that the scale box may receive materials from each of the 7 storage bins and deposit them at each of the 4 cupolas.

Blast-furnace slag, limestone, silica rock and coke are hand-charged into the cupolas in layers. Each cupola obtains its air blast from an American Blower fan connected to a bustle pipe supplying tuyeres which pass through the furnace shell near the base. The limestone and silica rock function as a flux and, in addition, the latter may be increased to maintain chemical balance when the calcium content of the slag runs high. The coke functions solely as fuel.

At the maximum cupola temperature of 3,000 degrees F. the raw materials are reduced to a molten mass which is tapped through a port at the base of the furnace and divided into 2 streams. The streams of molten slag fall through a blast of live steam which carries the fibers through a spray of binders into an annealing chamber with a floor consisting of an endless conveyor. As the newly-formed rock wool fibers advance slowly through the furnace they are gradually cooled and tempered.

From the annealing chamber the

Bagged loose wool, in 40 pound sacks, being weighed.

Superintendent Kilgore inspecting cutting operation and quality.

Truck unloading raw material used in manufacture of rock wool.

fibers enter an oven, where they are compressed and the binders are set. The product, now in sheet form, advances onto a cutting table where multiple circular knives split it into several strips of the desired width. The strips then pass under rolls where vapor-proof paper is applied to the upper side. The finished rock-wool batts are cut to the proper length, inspected and packed in cartons ready for shipping. From the time the fibers are blown into the annealing chamber until the final cutting to length of the finished batts, the product advances steadily over a series of Link-Belt conveyors equipped with Cyclone woven-wire belts.

In the production of loose rock wool the binders are omitted and the product may be bagged for shipping when it leaves the annealing chamber. Granulated rock wool is produced by feeding the product of the annealing chamber into cylinders where it is shredded and beaten into granules of the desired size. Special screens modulate the material and remove all foreign particles before the product is bagged for shipping. The bags are filled to their approximate capacity under metal chutes and are then trimmed accurately to 40 pounds on Howe portable platform scales.

The cupolas operate 24 hours a day for 6 days; on the seventh day they are dumped and the week's accumulation of iron is drained from the clay bottom. Although longer continuous runs have been made, it has been found that dumping the cupolas once a week results in better over-all performance.

Since the outbreak of the war the Dover plant has shipped vast quantities of rock wool to the Maritime Commission for the insulation of cargo vessels. The nation-wide effort to conserve critical fuels has resulted in an unprecedented demand for granulated rock wool, which is blown into the walls of existing structures to reduce heat losses.

Charging the cupola with prepared material. Monorail hopper is shown at left.

Under normal conditions this heavy military and civilian demand would require 120 to 125 men per shift, but Selective Service and the labor requirements of war industries have made it almost impossible to maintain so large a force at Dover. Women workers are now employed wherever it is possible to use them, and training programs for inexperienced workers are constantly in progress. Despite the steady influx of new employes, the plant has recently received a safety certificate from the New Jersey State Department of Labor for operating without an accident during the last quarter of 1943.

Robert Kilgore is superintendent of the Dover plant and William K. Trowbridge is supervisor of personnel and safety.

Bagging loose wool as it comes out of annealing oven.

General view of the plant.

In anticipation of the expansion in construction, excavating and materials handling fields after the war, The Osgood Company and The General Excavator Company, Marion, Ohio, recently announced the appointment of seven new distributors: Acme Equipment Company, Detroit; Arthur C. Leake, Middletown, Virginia; Municipal Sales Company, Richmond, Virginia; Walling Tractor and Equipment Company, Portland, Oregon; H. L. Baxter, Toronto; Rousseau Equipment Company, Winnipeg; and Dominion Distributors, Ltd., St. John's, Newfoundland.

RESIDENTIAL BUILDING AFTER THE WAR

By MELVIN H. BAKER
President, National Gypsum Company

another P AND Q exclusive

WHAT role will residential building play in the post-war period?

To determine the answer one must base his conclusions upon a number of assumptions and any one of these may be challenged. The data concerning our present housing are incomplete and inconclusive; many factors that bear on residential construction are hidden in the future. But regardless of these factors, any approach leads to only one conclusion: home construction in the post-war years will be greater than ever before.

Building gave us our prosperity in the 20's and it seems destined again to supply the needed economic impetus.

Let's consider a few facts as they appear to-day.

It is agreed that due to war-time restrictions there has accumulated a pent-up demand for new homes, improvements and repairs to present homes. During the first ten years after the war net additions to the number of families are expected to average about 500,000 a year, all in non-farm areas. These new families must be housed. Another large potential demand will come from those who live in houses physically worn out or inadequately equipped.

There are estimates of needed post-war homes ranging from 400,000 up to 2,000,000 dwellings a year. It is quite practical to assume that there will be a gradual increase from about 500,000 in the first peace year to a higher level that will amount to at least 10,000,000 homes within the first 10 years following peace.

Statisticians have figured it out this way: families now living doubled up because of housing shortages will provide a demand for something like 2,500,000 dwellings. This, however, does not include the new homes required for 3,000,000 new families that resulted from war-time marriages.

In back of all this lies the vast, long-standing need for better shelter for the low-bracket income class.

All this, of course, depends on the willingness of the people to invest their savings in new houses. And here lies a challenge to all those who produce materials for home construction, manufacturers of furnishings and equipment, architects, contractors, real-estate men and bankers.

This challenge offers a big opportunity for leadership and organized ability in the many industries and professions directly dependent on home construction. Through realistic community planning building can easily become the spearhead to prosperity for all business. Its potentials for good are sufficient to command the united efforts of all.

The housing stock as a whole is in an extremely deteriorated condition. A recent government census showed that of 37,000,000 homes 50 per cent. are more than 40 years old, 6,500,000 need repairs, 5,000,000 are not fit to live in, and 15,000,000 have no bath facilities.

America is underhoused. These deteriorated, under-equipped, out-of-date houses represent a demand for replacements. From increasing population and depreciation alone there will be a continuing annual need for 87,000 additional homes. And when we appraise the accumulated shortage we should compare this figure with an average of 415,000 homes built in each of the last 14 years.

This great need for homes naturally brings up financing which must be geared to realities—a job for the banker. He can make possible home ownership through a plan that would make available money on terms for the millions now poorly housed.

An important element in this regard is the buying power the people will have in accumulated savings after the war. It is impossible to estimate what the volume of savings will be, but current records indicate that individuals are saving at a rapid rate. Cash in the hands of the public and all commercial bank deposits, it is estimated, now aggregate as much as $135,000,000,000. Individual holdings of currency, bank deposits and government bonds, according to the Securities and Exchange Commission, have increased $76,500,000,000 in the last four years. That's just the increase. Figures for 535 savings banks in the 17 states as of June 30, 1944, totaled approximately $13,000,000,000 with a record number of 17,000,000 depositors.

In the 6,700 savings-and-loan associations in the United States there is on deposit $6,500,000,000.

Farmers in 1944 will have cash income of an estimated $21,000,000,000 or 2.5 times as much as they had in 1939 and $1,000,000,000 more than in 1943.

There is every reason to expect great potential buying power in the post-war period. Payments to veterans, tax free, will range from $3,000,000,000 to $5,000,000,000 a year as a sort of pump-priming force in the early post-war years.

Another element that needs to be mentioned in this connection is the credit position of the public. Here exact estimates are not available, but from current records we know that debts are being paid off at a rapid rate. It is estimated that the consumer installment debt is now down to $2,000,000,000 compared with over $9,500,000,000 before the war. We may well have a situation, therefore, in the post-war period, in which the general public is largely out of debt and in a position to add billions of dollars in buying through credit purchasing.

The willingness of people to use their buying power to purchase goods will depend upon their confidence in the future; upon their belief in the future for America will depend their willingness to spend and invest; in brief, confidence that they will continue to have jobs at good wages.

This brings the banker into the picture. As has been said, he can make possible home ownership through a plan that would make available money on terms for the millions now poorly housed.

In this connection the mortgage bankers' association recently issued a significant statement: "The most certain factor in the whole post-war construction picture is that there will be more financing facilities for the next great wave of building. Mortgage financing will be available in an amount never before seen in this country and on the best terms and conditions the American people have ever been offered."

The family with an income of $175 a month should be able to own a $5,000 house—the kind of home that would be a good investment for the owner and a safe risk for long-term mortgage by the bank.

But to come within the means of this income the monthly outlay for interest, payment on principal, taxes, repairs, and insurance, should not exceed $45. This then determines the kind of planning necessary to induce home ownership and better living for our people.

In considering the credit risk let's

study the kind of house that will be obtainable for $5,000 after the war. It will be built better than the house built in the 30's. There will be improved materials with greater protection against depreciation from decay and obsolescence.

It will be well insulated to conserve fuel in winter and to provide greater comfort in summer. It will be constructed with more fire-resisting materials. It will be attractive in appearance and fashioned to embody the owner's individual ideas. It will be a much safer risk than the home financed ten years ago.

A larger investment will be needed for the post-war home. The cost of labor and materials will be higher. However, this will be partially offset through careful planning for the use of unit sizes in structural materials and equipment, thereby benefiting from new techniques in design and construction. There will be less expense for mortgage financing, interest charges and monthly outlay for amortization. Cost will not be the only consideration. More money will go to buy conveniences and attractiveness in the kitchen and the bathroom. In the end more capital will be needed, but this home will surely be a bargain compared with those built in the 20's.

There will be many new appliances and gadgets; but, the post-war house isn't going to be a miracle house as envisioned by some. The war has brought about rapid improvement in steel, aluminum, plastics and many other materials useful in building and these improvements will all be found in the home of tomorrow. But the push-button fantasy is still a figment of wishful thinking. Anyone who expects to build the so-called "miracle house" is in for a long wait.

And what will the post-war house look like? A recent survey made by a leading publication sums it up: "Livability is the keynote of the average post-war home, with a new emphasis on comfort, beauty, efficiency and economy—both in cost of operation and maintenance, and in woman and man hours." As would be expected, more attention will be directed to orientation. There will be more interest in the neighborhood surroundings and landscaping.

Already there have appeared many improvements in building materials and equipment, but nothing radically new. As an example, the National Gypsum Company will be ready to supply certain basic materials as soon as their war-time use has been completed. We now have in production weather-protected sheathing made from fireproof gypsum, a waterproof rock wool that will fireproof and insulate walls and roofs at low cost, a crack-resisting base for plaster and a low-cost washable paint that will make sanitary and colorful interiors. These are not new; the pre-war product has simply been improved under pressure of mass production for military use.

I, for one, am a firm believer in planning, preceded by a study that will clearly indicate a purpose for such planning. But the post-war period must be approached realistically with a philosophy of hard work and tested rules.

If we then accept this challenge fearlessly and sensibly, the results will give this great country of ours undreamed-of prosperity and a still higher standard of living that will advance civilization throughout the world. Without this we shall be plagued with government-controlled economy, followed by depression and subsistent standards of living and in the end loss of a great birthright.

In thinking of the future we must not overlook those who, because of low income, can not pay full rent and provide the things for essential living.

These are the unfortunates who, through no fault of their own, now live in unsanitary blighted areas. If we would have a better America these 4,000,000 families must be taken out of their present surroundings. Local welfare agencies should assume this responsibility through the use of public-welfare funds. Old homes, more favorably located, could be leased for use by these families and the agency would absorb any rent in excess of what rent the occupants could afford.

In this way the city would slowly vacate and take over its slums without resorting to the use of federal funds. Such a program would encourage the construction of new homes by providing an income from the old ones, and then the owner would be relieved so that he could build the new house his family has been planning for.

Social improvement must be a part of our planning. In a wealthy country such as ours it seems strange to find the slums and poverty that exist in some of our towns and cities. We can not have what we are fighting for so long as these blighted areas exist with insanitary and low standards of living. It is within economic possibilities for our cities to purchase these slum sections, convert them into parkways, streets and desirable locations for new buildings.

Planning for this is not an overnight accomplishment. A program should be formulated now and detailed, if these are to become active job-making projects when the war ends. And this can be done only in an environment of co-operative action between government, private business and labor.

No community is too small or too large to inventory its needs for public buildings, schools, and facilities for better transportation. A study of post-war potentials for business in each community may direct private capital to the building of better and more commercial buildings, such as stores, offices and the like. And, in this connection we know now that under proper environment there will be very good prospects for 50 per cent. more business than in 1940, and to distribute this increase would require greater facilities for the retail and service organizations.

It is generally accepted that building construction offers our greatest opportunity for jobs and prosperity. Then it follows that the quicker a widespread construction program begins, the sooner jobs will be available after demobilization. By encouraging home ownership we not only make jobs but will make better citizens. As the owner of a home the citizen pays taxes and assumes an obligation in the community. And he will take a greater interest in local, state and federal governments.

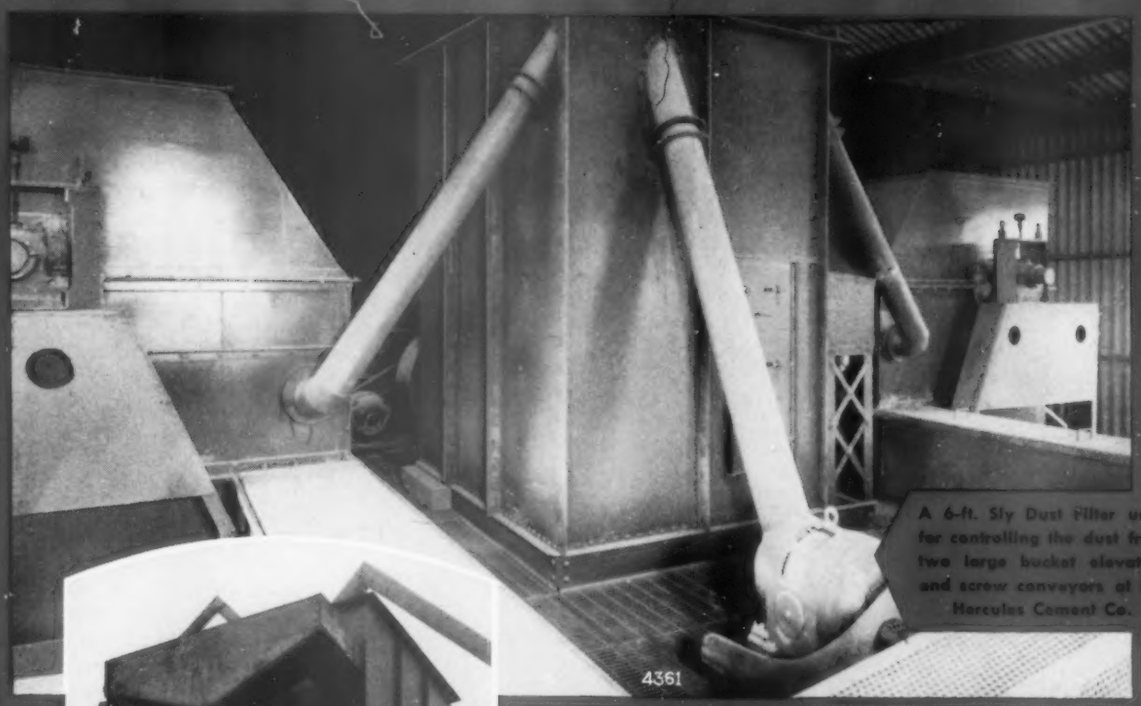
And since the home has always been the most vital unit in our economy, we can have a better America only through the home.

Given the kind of leadership that will strike out defeatism and encourage home ownership, we will have a dynamic economy, resulting in higher standards of living for everyone.

In this vast country we have the greatest resources in the world, the skill and the money. If we put these to use we can create new standards never dreamed of in the history of the world.

DR. J. D. FORRESTER, for several years on the faculty of the University of Idaho, has been appointed head of the mining department of the Missouri School of Mines and Metallurgy, Rolla, Missouri. He succeeds Dr. S. A. Trengove, and will assume his new postion August 1.

L. C. WHITAKER has resigned as associate director of WPB's Mining Division, to return to private business activities in New York. He will, however, continue to serve as a consultant to the officials of the division.



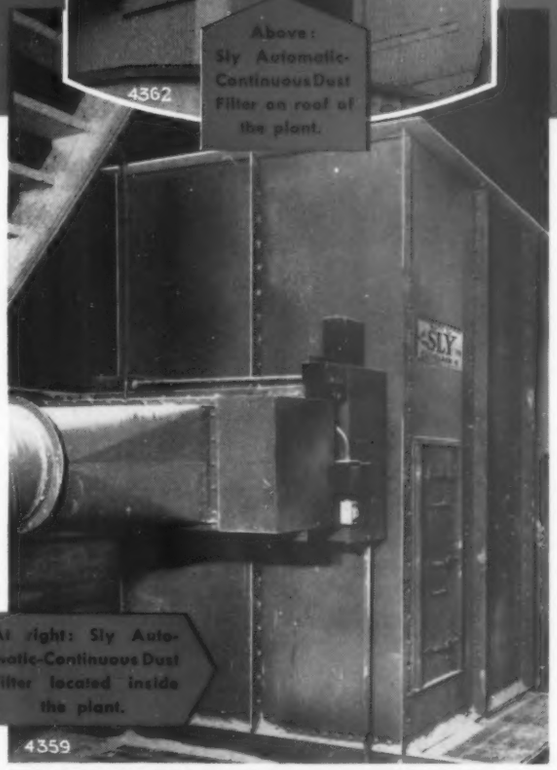
A 6-ft. Sly Dust Filter used for controlling the dust from two large bucket elevators and screw conveyors at the Hercules Cement Co.

4361

Above: Sly Automatic-Continuous Dust Filter on roof of the plant.

4362

Important Savings with SLY DUST Control



At right: Sly Automatic-Continuous Dust Filter located inside the plant.

4359

● This large modern plant of the Hercules Cement Co. uses both automatic and automatic-continuous Sly Dust Filters.

Only Cloth-Screen Type Filters will collect the really *fine* dust. Compared with other cloth-screen filters, Sly provides greater filtering capacity, power savings, easier bag replacement, automatic control, and effect important economies in operation and maintenance.

May we discuss *your* dust problem with you?

THE W. W. SLY MANUFACTURING CO.

4745 TRAIN AVENUE • CLEVELAND 2, OHIO

SLY

INDUSTRIAL DUST CONTROL

Training of Diesel Operators Is Discussed at DEMA Meeting

Standing, left to right—Harvey T. Hill, exec. director DEMA; Paul J. Every, Baldwin Locomotive Works; John W. Anderson, American Locomotive Co.; Prof. Robert B. Rice, educational consultant DEMA; Henry J. Barbour, Fairbanks, Morse & Co.; Walter A. Parrish and J. A. Spalding, National Supply Co.; D. C. Peterson and M. C. Wright, Atlas Imperial Diesel Engine Co.; Roland W. Bayerlein, Nordberg Mfg. Co.; Rer W. Wadman (guest), editor and publisher Diesel Progress, and Roy A. Hundley, Enterprise Engine & Foundry Co. Seated, left to right—Louis R. Ford (guest), editor Motorship; S. S. Sample, Busch-Sulzer Bros.-Diesel Engine Co.; Gordon Lefebvre, committee chairman, Cooper-Bessemer Corp.; George Mueller, General Machinery Corp.; W. E. Wechter, Worthington Pump & Machinery Corp., and George J. Rathbun, Rathbun-Jones Engineering Co.

Manufacturers of Diesel engines, meeting at a luncheon in the La Salle Hotel, Chicago, October 7, heard 23 deans and top-flight engineering instructors describe the pressing need of better facilities for turning out competent operators. Many of the latter, comprising one-third of the nation's engineering students, had traveled 1,000 miles to be present.

In response to a plea for modern, smaller type engines for students to dismantle and study, Gordon LeFebvre, chairman of the Diesel Engine Manufacturers Association educational committee, said that DEMA had been trying to procure them from government wartime surpluses.

Professor Paul E. Mohn, University of Illinois, stressed the need for improved Diesel text books. He characterized many now in use as "very inadequate and frequently erroneous." This view was supported by Professors Carl Wischmeyer of Rose Polytechnic Institute and Charles W. Good, University of Michigan.

Other topics discussed were the mutual benefit to be derived, by schools and manufacturers, from having students and instructors spend part of their time working in Diesel factories; the amount of specialization engineering courses should include; facilities for doing research; the establishment of fellowships by manufacturers; and the nature of post-graduate work.

Professor Robert B. Rice, noted Diesel engine instructor at North Carolina State College, has been engaged by DEMA as educational consultant. Manufacturers present were unanimous in pledging their support of whatever was needed for a well rounded Diesel engineering education.

F. H. Kilberry, president of Atlas Imperial Diesel Engine Company, who was unable to attend the meeting, was represented as vice-chairman of DEMA's educational committee, by M. C. Wright and D. C. Peterson, vice-president and manager, respectively of that company.

Boston Symphony on the Air for Allis-Chalmers

Men and women workers of the Mining Industry will be honored on November 11 by the Allis-Chalmers broadcast of the Boston Symphony Orchestra in the second of a series of six salutes to American industry and American workers.

These salutes, scheduled by the Allis-Chalmers Manufacturing Company, pay tribute to the distinguished service of both management and labor in time of national crisis. Staats Cotsworth, actor, is narrator for this series of brief intermission features from October 14 to December 23.

In addition to the Mining Industry, salutes will be tendered Chemical and Processing, Pulp and Paper, and Oil industries.

Allis-Chalmers advertisements featuring these salutes will run in trade publications and newspapers in key production cities. Industrial executives, city officials and heads of business groups in each of these cities will be notified in advance of the highlights of the particular broadcast.

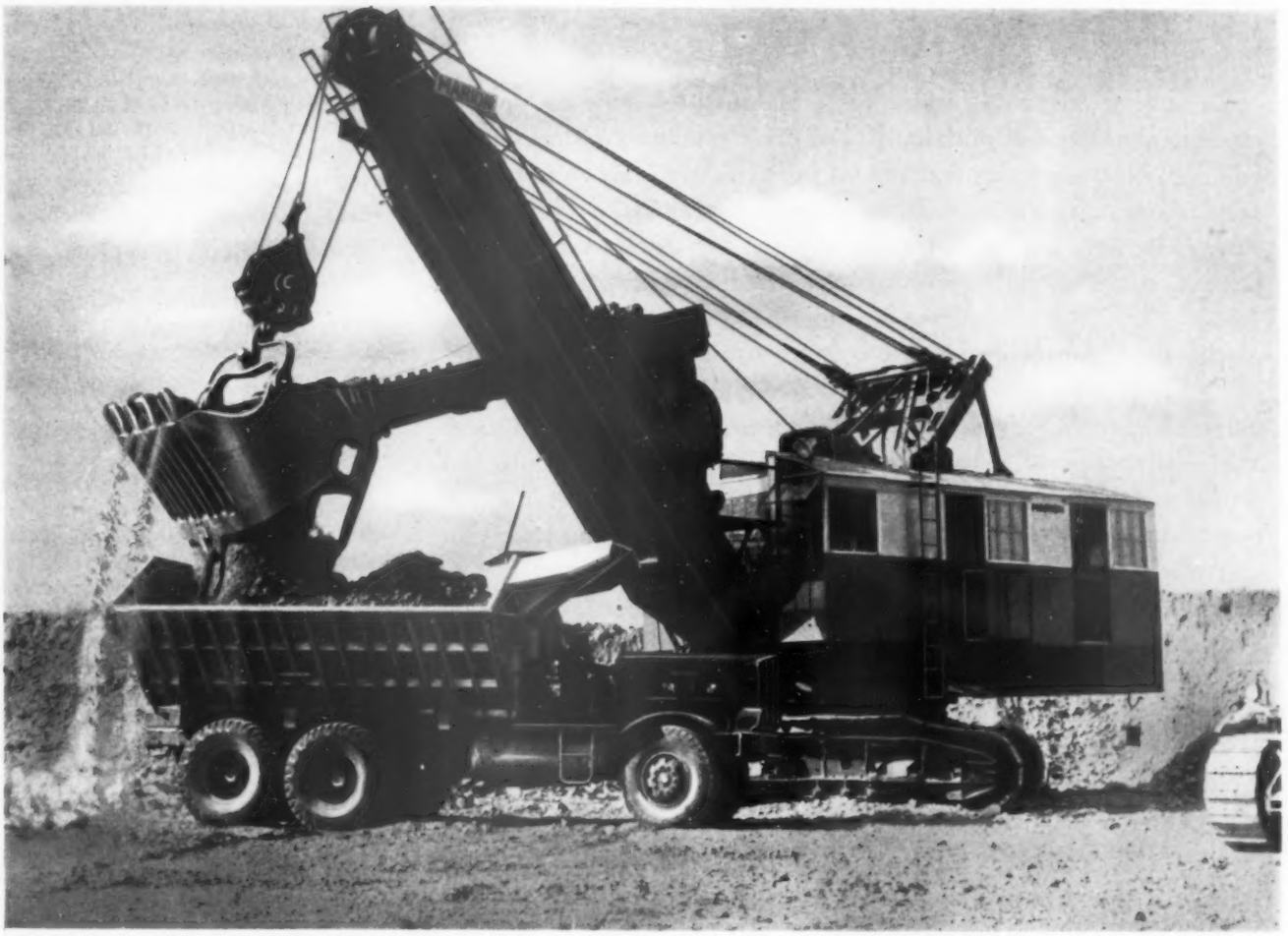
Broadcasts of the Boston Symphony Orchestra are heard for the second consecutive year (8:30 p. m., EWT, Saturdays, Blue Network) under the direction of Dr. Serge Koussevitzky. There will be one concert broadcast from Milwaukee, the home of Allis-Chalmers, the sponsors, and five will originate in New York, the remainder eminating from Symphony Hall in Boston.

A. B. Grafius has retired as vice president of the Coronet Phosphate Co. after 27 years of service. He will continue to act as a director of the company.

Hubert O. De Beck, who has been district manager and field engineer for Colonial Mica Corp. at Custer, S. D., is now technical assistant to the president in the company's New York office.

In keeping with plans to better serve west coast territory, the H. K. Porter Company, Inc., of Pittsburgh, recently opened offices at 849 Petroleum building, Los Angeles, W. W. Calihan, director of sales, announces. Harold A. Hintz, formerly field sales engineer for Axelson Manufacturing Company of that city, has been appointed district manager for the territory, with headquarters in Los Angeles.

BETTER *Lubrication* Means Better Maintenance



Is difficult maintenance a problem? Maybe excessive wear due to inefficient lubrication is the cause. That's where Sinclair lubricants can help.

SINCLAIR PENNSYLVANIA and OPALINE MOTOR OILS have the tough film strength that holds down engine wear, lay-offs and replacements. Sinclair specialized gear lubricants and greases are highly efficient under heavy duty operating conditions. Sinclair TEN-OL 200 provides better lubrication for hard-worked Diesel-powered equipment.

• • •

(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

A Fitting Example for Suction Dredge Operators . . .

Hydraulic dredges operating with high pipe line velocities and pressures, and handling abrasive solids intermixed with boulders, should be equipped with Amsco manganese steel pipe line fittings if maximum ultimate economy is to be obtained.

The use of this metal, with its strength, ductility and work-hardening quality, precludes fracture from shock, gives long wearing life against abrasion and obviates bursting when the parts are worn thin.

Moreover, Amsco design—resulting from long and varied experience in serving dredge operators—affords such features as proper radii for long sweep elbows, correct metal thicknesses and other apparently small but important details.

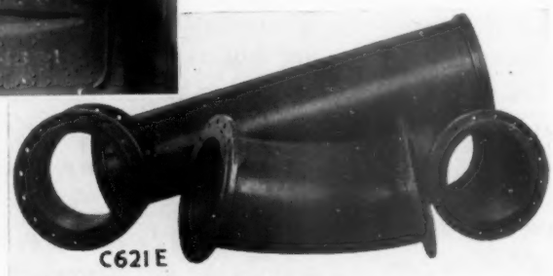
Standard Amsco fittings include elbows, pipe, nipples, reducers, expansion joints, flanges, flap valves and the like in sizes from 3″ to 18″. Larger fittings and such items as tees, "Y" 's and laterals are supplied to fit individual requirements.

The pictures show a shipment of Amsco manganese steel fittings to U. S. Engineers for a river dredge having 20″ diameter hull piping. The carload in Picture C-621 consisted of 25 tons, or 38 pieces of various types, from plain straight pipe to special reverse bends and bulkhead pieces. Picture C-621E gives a close-up of typical pipe and fittings on this order.

Suction dredge operators who follow the example of their Uncle Sam will find that Amsco pipe line fittings are definitely the most economical in service life, steady production and maintenance cost.

•

Send for Bulletin No. 844-D — "Manganese Steel for All Dredging Purposes."



C-621 A carload of Amsco manganese steel dredge pipe line fittings for the U. S. Engineers.

C-621E Pipe and fittings for suction dredge.

Send for Bulletin 941-W on Amsco Conservation Welding Rods

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

AMERICAN Brake Shoe COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

PERSONAL MENTION

EMILE N. VIDAL, Denver engineer who died last year, is to be honored by having a new concrete dry-cargo ship named after him. For 18 years a concrete engineer for the United States bureau of reclamation, Mr. Vidal had direct charge of the concrete and metals testing laboratories.

FLOYD B. BROWN, formerly general mining superintendent of the Florida Division of International Minerals and Chemical Corporation, has been named manager of the Tennessee Phosphate Division of that company, at Columbia, Tennessee.

ROBERT HALOWELL RICHARDS, professor emeritus of mining engineering at Massachusetts Institute of Technology, celebrated his one-hundredth birthday, August 26. He is the Institute's oldest living graduate, having been one of the first to receive the B.S. degree in 1868. He joined the faculty in 1873, and retired in 1914, after teaching for 46 years. His writings on numerous mining subjects brought him international fame and numerous scholastic honors. In the fields of education and invention he was a true leader, his keen powers of observation and creative genius proving an inspiration to many. Professor Richards still lives in the home to which he and his wife moved seventy years ago, at Jamaica Plain, Massachusetts.

C. H. LAGE was recently named general works manager in charge of all plant operation and production of the LaPlante-Choate Manufacturing Company, Cedar Rapids, Iowa.

H. F. THOMPSON, vice-president of the General Material Company, St. Louis, has been named a director of the American Society of Civil Engineers, for the southwest district which includes most of Missouri, Arkansas, Oklahoma, Western Illinois, Kentucky, Tennessee and Mississippi. He will take office next January, for a term of three years.

WALTER P. KONRAD has been made branch manager of the phosphate division of the Monsanto Chemical Company sales department in Chicago.

E. F. Haberkern

E. F. HABERKERN has been appointed district manager of the recently reopened St. Louis office of the Superior Engine division, National Supply Company. Mr. Haberkern attended the University of Notre Dame, graduating in Mechanical Engineering. For many years he was employed in the Springfield plant of the Superior Engine division, in the shop and the sales, production and service departments.

R. C. MATTHEWS, plant superintendent of the Marquette Cement Manufacturing Company, Cape Girardeau, Missouri, recently announced his retirement after 34 years with that company. He assumed the superintendency in 1925, after serving in various positions.

CHARLES ROEBLING TYSON has been elected president of the John A. Roebling's Sons Company, manufacturers of wire products with plants in Trenton and Roebling, New Jersey. He succeeds the late William A. Anderson. Others elected were, Lieutenant Joseph M. Roebling, chairman of the board; Archibald W. Brown, treasurer, and H. D. Rathbun, secretary.

W. G. PERROW, district manager of the Lehigh Portland Cement Company at Spokane, Washington, has been named temporary chairman of the newly-formed Spokane Construction Council. Howard H. Mansur, production manager of the Washington Brick & Lime Company, is serving as secretary.

The Council is composed of about 30 firms representing the construction industry of Spokane and ultimately it is expected that more than 200 eligible firms and individuals will be enrolled. Aims of the Council, as outlined by Mr. Perrow, include the fostering of private enterprise, fair-trade practices and providing generally better services to the building needs of Spokane.

ROBERT B. SEMPLE, associate director of development, Monsanto Chemical Co., St. Louis, Mo., has been loaned to the Office of Production Research and Development of WPB for special work in connection with the technical manpower problem in the chemical industry.

Morris PUMPS Plus Morris SERVICE

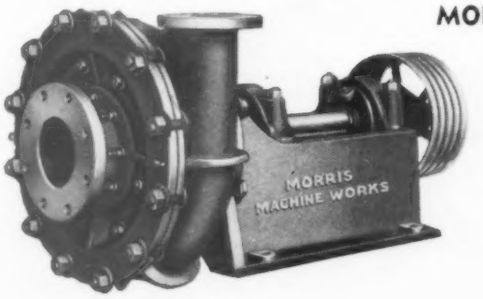
Maintain Uninterrupted Output of Essential Materials

TO FURNISH on time hard metal housing liners—Morris Flintmetal—as effective substitutes for unobtainable pure gum rubber covering and unsatisfactory synthetic rubber, has been a highly necessary wartime service for the Pennsylvania Glass Sand Corporation.

"These particular liners are being used in the exclusive production of material for the aircraft industry," writes E. O. Banker, Purchasing Agent—"hence our desire to be sure that the pumps do not fail at any time. We greatly appreciate the special efforts you have made on various occasions to rush the liners to us. Thanks for your splendid cooperation."

★ Glass sand slurry, one of the sharpest and most abrasive commercial elements, is handled at 170 GPM by 3-inch Morris Slurry Pumps at the plants of Pennsylvania Glass Sand Corporation, Lewistown, Pa. A 30 to 40 per cent silica sand slurry, 1.35 specific gravity, is pumped from the bottom of a Dorr thickener into the plant for further processing. The static discharge head is 72 feet . . . *but the actual dynamic head in this system is estimated at 152 feet.* Here you have that combination of highly abrasive material and exceptionally high head that results in unusually severe service . . . just the sort of service, however, that Morris' 75 years of pump manufacturing experience is able to meet.

Consultation and information on your pumping problems and projects furnished on request, without obligation.



MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

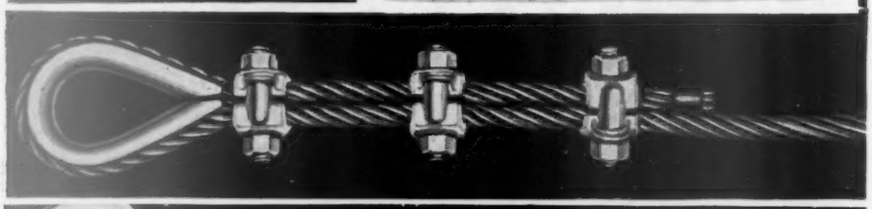
MORRIS

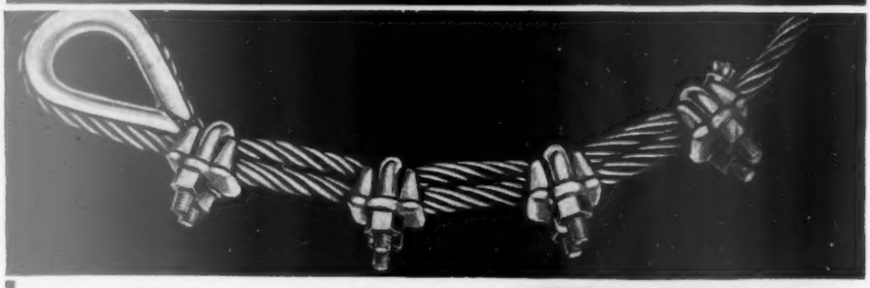
HAVE YOUR ROPE CLIPS A

"FIST-GRIP"?

LAUGHLIN "FIST-GRIP" CLIPS

SAVE ROPE — SAVE CLIPS
SAVE TIME





OR A

"FINGER-PINCH"?

ORDINARY U-BOLTS

WASTE ROPE — WASTE CLIPS
WASTE TIME

Help Yourself and the War Effort by Using Laughlin "FIST-GRIP" Clips

Congratulations to the wire rope companies in Victory Rope-Saving Drive! Keep it up.

Wire rope users—if you haven't used Laughlin "Fist-Grip" Safety Clips to help you in this program . . try them now. See how they save rope . . and clips, time, and tools as well.

Laughlin's complete line of wire rope and chain fittings is distributed through Mill, Mine and Oil Field Supply Houses.

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company

PORTLAND 6, MAINE

OBITUARIES

HENRY CARTER, 57, Hurley, Wisconsin pioneer,, passed away September 12, at his home. Mr. Carter was born in New York, but came to Hurley with his parents at the age of one. Since 1928 he owned the Carter Sand & Gravel Company. He is survived by his wife and two sons.

ARTHUR PIERCE ROBINSON, retired vice-president of the Ransome Concrete Machinery Company, Dunellen, New Jersey, passed away September 30. He is survived by his widow, two daughters and a son.

RAY W. WILMER, 56, of Decatur, Missouri, traveling representative of the Cumberland Portland Cement Company, died recently in Greenville, South Carolina. He is survived by his wife, a brother and a sister.

GEORGE C. BROWN, of Windsor, Nova Scotia, active in the production of lime and gypsum for many years, died recently, after an illness of four months. He was born in Halifax, N. S., 62 years ago and had been located in Windsor for a dozen years. Previously, he was at Amherst, N. S., for about 23 years. Surviving are the widow, one son and one daughter.

WILLIAM S. STOWELL, 60, a director of the American Cyanamid Company and president of the subsidiary unit, the Chemical Construction Corporation, died August 6, at his home in New York.

H. EDWARD MANVILLE, retired, former president and chairman of the board of the Johns-Manville Corporation, died at Pleasantville, New York, on June 27, at the age of 72.

FREDERICK KRAISSEL, 76, chemical adviser to the Corning Glass Company, of Corning, New York, died August 4.

HARRY S. WHERRETT, 68, chairman of the board of directors of the Pittsburgh Plate Glass Company, gust 13.

J. G. LUTHER, who has been acting superintendent at the Trident, Montana plant of the Ideal Cement Company of Denver, on November 1, will be promoted to superintendent of that property.

Legal Decisions

Blasting Liability

The higher courts in the different states do not agree regarding liability for injuries to persons and property caused by blasting operations.

It is interesting to observe that one line of higher court cases holds that, even in the absence of negligence, a company engaged in blasting is liable for damages caused by vibration and concussion. Another line of higher court cases holds exactly to the contrary. These two lines of authority are discussed in 22 Am. Jur. 180, and 35 C. J. S. Explosives, 8, p. 238. In the annotation in 92 A. L. R. 741, the case of *Holden v. Carmean,* 178 Ark. 375, 10 S. W. (2d) 265, the higher court clearly explains the varied law on this subject.

On the other hand, *all* higher courts agree that any and all companies are liable in damages for injuries caused by *negligent* blasting operations.

For illustration, in *Benton Gravel Company v. Wright,* 175 S. W. (2d) 208, reported December, 1943, it was disclosed that the owner of a dwelling sued a gravel company to recover for damages to his home. He proved that the company, in removing gravel from its near-by land, used dynamite in blasting and caused the well of the property to go dry. Also, because of the blasting the house was shaken and moved about on its foundations.

The important question presented to the jury was whether the gravel company should be compelled to pay an amount of damages based upon permanent or temporary injuries to the property. It rendered a verdict in favor of the property owner for $500 based upon permanent injury to the property. However, the higher court reversed the verdict, and said:

"If the injuries were temporary, then the rule would be that where the injury to real property is temporary, the measure of damages, in a case like this one, is the cost of restoration to condition prior to the injury plus decreased rental value from the time of injury to the time of award for restoration. . . The question of whether the injuries were temporary or permanent should have been submitted to the jury."

Indirect Injuries

Modern higher courts hold that, in order to justify the conclusion that an injury to person or property

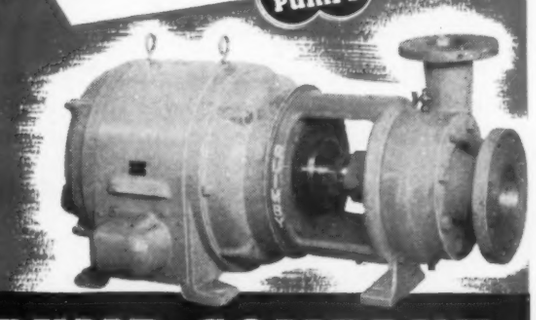
BROWNHOIST BUCKETS

Above you see a typical Brownhoist Bucket doing its share of speeding America's Industrial Production. Brownhoist buckets take deep, clean, bites. Extra large sheaves reduce rope wear and maintenance. Sturdy construction insures long life. For facts and prices about Brownhoist Rope-Reeve, Power-Wheel and Link-Type buckets write to Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.

Announcing
QUIMPACT
the New Quimby Close-Coupled Centrifugal Pump

- Compact, rugged, efficient, low cost.
- Hydraulically and mechanically balanced.
- Double volute construction on larger sizes to eliminate shaft deflection.
- Adjustable foot under pump frame supports pipe loads.
- Sealed shaft sleeve protects entire shaft extension.
- Sizes 1 in. to 6 in. for capacities to 1000 GPM, heads to 450 ft., temperatures to 350°F.

QUIMBY PUMPS



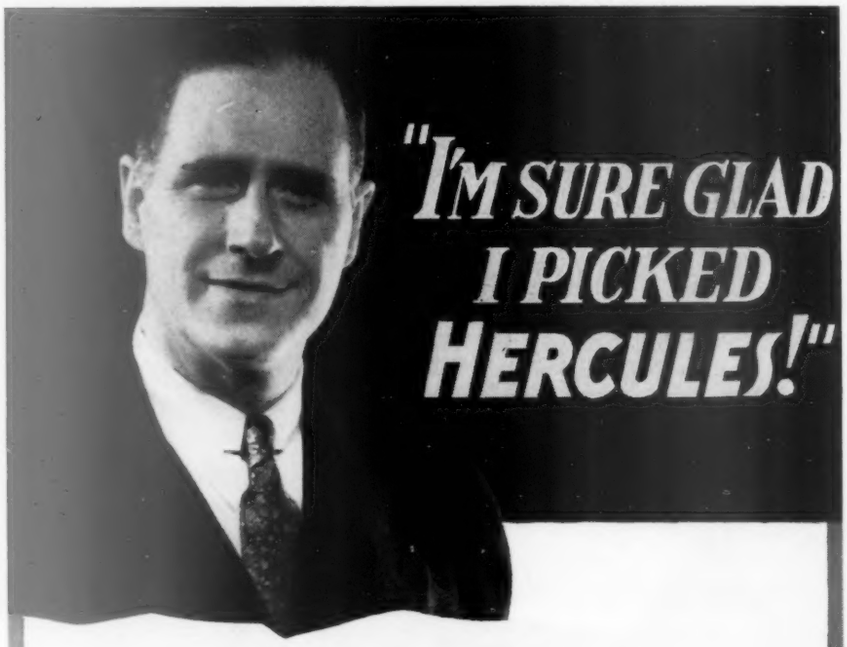
QUIMBY PUMP COMPANY
INCORPORATED
Division of H. K. Porter Company, Inc.
Pittsburgh, Pa. • Blairsville, Pa.
Newark, N. J. • New Brunswick, N. J. • Mt. Vernon, Ill.

was the natural and probable result of blasting operations, it must be shown that the party committing the act ought to have foreseen the consequences thereof in the light of the attendant circumstances. Otherwise the party who files a suit can not recover damages.

For instance, in *Uvalde Construction Company v. Hill,* 175 S. W. (2d) 247, reported December, 1943, it was shown that a company employee used dynamite to blast out rock. He set off a dynamite blast of such size and proportions that it caused a violent explosion and concussion. The explosion was attended by a shaking of the ground and buildings in a near-by barn lot, in which a woman was engaged in milking a cow. The cow was so frightened and terrified that she bounded against the woman, knocking her to the ground, and turned and trampled upon her, thereby severely injurying her. She sued the company to recover damages.

In refusing to allow damages, the higher court said:

"To our minds, injuries received under such circumstances, as a matter of law, can not be said to have proximately resulted from the act of defendant (employee) in causing this blast or explosion."



"My fleet of Hercules Dumps has had a real workout the past few years, but every job has come through with colors flying.

It's really surprising how seldom Hercules bodies need service or repairs, and when they do, my Hercules distributor is right on the job.

My drivers like Hercules Hydraulic Hoists because of their ample reserve power, their dependability, and their "button-ease" dash controls, with no levers in the cab.

That Hercules slogan, "Men like to say they use them", certainly applies to me!"

Write us, or see the nearest Hercules Distributor regarding the Dump Bodies or Hoists you need now.

HERCULES STEEL PRODUCTS COMPANY
GALION, OHIO

Who Is Common Carrier?

A private carrier is liable for loss of or damage to shipped merchandise *only* when the testimony proves that such loss or damage resulted from want of "ordinary care" of the carrier's employee. However, a common carrier is liable practically as an insurer against any and all losses or damage to shipped merchandise.

In *Larson v. Etna Company,* 143 Pac. (2d) 850, reported January, 1944, the higher court held that a company engaged in casual hauling is not a common carrier. This court said:

"It is generally considered that where the carrier undertakes to carry only for the particular occasion, he can not be held responsible as a common carrier."

The legal effect of this decision is that if the carrier is employed in transporting goods for one, or a *definite* number of persons, by way of special undertaking, he is only a private carrier. To constitute one a common carrier he must make that a regular and constant business, or he must hold himself ready to transport for all persons, indifferently, who choose to employ him."

Validity of Consideration

All contracts without legal "consideration" are void. For example, a promise to do something can not be enforced unless the other party does "something" also.

For example, in *Jack v. Clage,* 142 Pac. (2d) 111, reported November, 1943, it was shown that two partners having some experience in the sand-and-gravel business desired to obtain a contract to furnish sand and gravel for use in the construction of a public improvement. However, they were without funds to present themselves properly as solvent bidders. They secured another man, named Jackson, to finance them. Still another man, named Clage, promised to assist in getting the contract if Jackson would pay him 2 cents per ton for all the material crushed. It was estimated that the amount of material to be furnished would be approximately 500,000 tons. Jackson wrote a letter to Clage promising to pay him the

agreed 2 cents per ton if they were awarded the contract. Later Clage sued Jackson to recover $12,000, his commission on 600,000 tons of rock supplied to a construction company by Jackson and the two partners.

Jackson contended that the letter relied upon to bind him personally to make this payment was obtained by fraud in that it was falsely and fraududently represented to him that the contract to furnish the material could not be obtained without the payment of the fee or commission to Clage. The evidence showed that Clage did nothing to assist in getting the contract except he introduced the two partners to the purchasing agent of the construction company which bought the material. The lower court held Jackson liable, but the higher court reversed the verdict saying:

"It is the general rule that in an action to compel payment as per contract the defendant (Jackson) may introduce parol evidence as to the lack of consideration and when the contract is in the form of a letter promising to pay, it is competent to show by parol evidence that the consideration was a promise of service to be rendered and that no such service was rendered. . ."

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

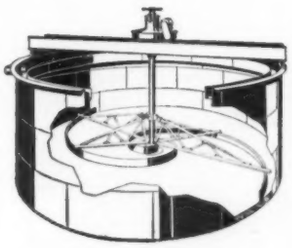
Legal Editor: A railroad which owns a gravel pit contracts with an independent contractor for the loading and processing of the material on a yardage or tonnage basis. The contractor is in charge of the operations at the pit, which produces material for use as ballast by the railroad. Any material produced in excess of the railroad's needs is sold to a company in Chicago for resale in the commercial market. The estimated loadings are 3,000 cars of ballast and 1,000 cars of sand for commercial sale, or about one-third of the output goes into commercial channels.

X is employed by the railroad company as inspector, receiving his pay from it. His duties involve the inspection of the material in all the cars, whether their contents are ballast for the railroad or sand for commercial use. He keeps a record of both materials and must make daily reports of all loadings. In short, he is held responsible to see that no cars are overloaded and reports their contents by telegraph and in writing to the railroad company officials. Is X working under the Fair Labor Standards Act and is he entitled to overtime compensation as specified by it, or is he working under the Interstate Commerce Act or the Railway Labor Act?—W. C.

Answer: The inspector may be paid by the railroad company, yet he may be the legal employee of the independent contractor provided the latter "controls" him. In other words, if the contractor instructs the inspector as to his duties or the contractor has the privilege of discharging the inspector, or if the salary of the inspector was deducted from the reasonable value of his services in loading and processing the sand and gravel in arriving at the amount of payment received by the contractor, then under these circumstances the inspector may be the legal employee of the contractor.

As to whether the inspector's work is connected with interstate commerce depends upon whether a reasonably large quantity of the sand and gravel is shipped in interstate commerce.

Hardinge Thickeners



Extent of Use

Several hundred Hardinge Thickeners are operating in metallurgical and chemical plants in sizes from laboratory units to large units.

Mechanical Features

Auto-raise protects scraping and driving mechanism from overload. Spiral scraper insures rapid and positive removal of solids.

Design Available

Standard steel, also stainless steel, wood and rubber covered mechanisms for use in corrosive liquids.

The Tray Thickener

The removal of solids from each compartment results in maximum settling capacity per square foot of floor of thickener floor space.

Bulletin 31-C

HARDINGE

COMPANY INCORPORATED, YORK, PENNA.

NEW YORK CHICAGO SAN FRANCISCO TORONTO

TRAFFIC News Digest

Central Freight Association

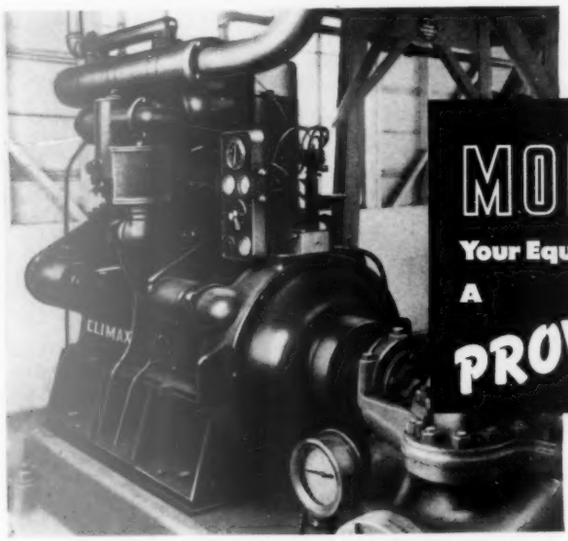
Amendment to W.D.A. 76279 (1).—Crushed stone, carloads, from Marble Cliff, Ohio, to points in West Virginia on the Guandotte Branch of C. & O. Ry. W.D.A. 76279 amended to include "West Columbus, Ohio," as origin point at the same rates as proposed from Marble Cliff, Ohio.

Docket 76294 (1).—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds. To establish rates on, from Hannibal, Marblehead and Quincy, Ill., to various points in Indiana and Ohio, per Exhibit "C."

Docket 76306 (2).—Gravel and sand, except blast, core, engine, filters fire or furnace, foundry, glass, grinding or polishing, loam, molding, and silica in open cars, carloads. Establish on, from Kenneth, Ind., to Burnettsville, Idaville and Monticello, Ind., rates of $0.55 per net ton. Proposed rate not to be published unless contract is secured and to expire December 20, 1944.

Docket 76321 (2).—Stone, crushed and screenings, carloads. Established on from Hillsville, Walford and Shaw Junction, Pa., to St. Marys, Pa., rate of $1.76 per net ton. Subject to increase under ExParte 148 (suspended).

Docket 76321 (2).—Crushed stone in bulk, in open-top cars, carloads. To establish on, rate of $0.99 per ton of 2,000 pounds, from Kenton, Ohio, to Clyde, Ohio.



MODERNIZE
Your Equipment Drives With
A
PROVED Climax
ENGINE

Standby power for the fire protection reservoir and pumping station in an aircraft plant is furnished by this Climax Model N4B engine.

HERE ARE A FEW ADVANTAGES YOU GET BY INSTALLING A CLIMAX ENGINE

A Climax engine will put new life into existing equipment, multiply its output and lengthen its productive life. The changeover can be made with a minimum of difficulty and at moderate cost. It may be designed, equipped and rated for the job.

For Stationary Installations these engines provide an unfailing source of power and give a lifetime of trouble-free service. They operate at low, medium, constant or variable speeds and burn natural gas, butane or gasoline. Climax engines are simple and easy-to-understand. There are no delicate adjustments to be made, no exacting tolerances. Every part subject to wear can be replaced easily and inexpensively by regular mechanics.

For Portable Service Climax engines are compact, adaptable and easy to install. They are built to take punishment and frequent overloading without impairing their output or efficiency. Their design flexibility and ease of relocation permit them to be hooked up to multiple installations.

"For High Achievement in the Production of War Material".
Climax Engineering Company
GENERAL OFFICES & FACTORY:
CLINTON, IOWA
REGIONAL OFFICES: CHICAGO, ILL., DALLAS, TEXAS
AFFILIATED COMPANIES: McAleer Mfg. Co., Chicago; Hanlow-Waters Co., Tulsa

CLIMAX ENGINES are 4, 6, 8 and 12 cylinder gas engines with ratings from 8 to 495 h.p. Climax Diesel engines are made in two models rated at 22 and 44 h.p. The gas engines operate on natural gas, butane or gasoline.

FOR COMPLETE INFORMATION write Climax Engineering Company, 1809 South Fourth Street, Clinton, Iowa.

Docket 76323 (1).—Slag, commercial crushed (a product of iron and steel blast or open hearth furnaces), in open-top cars, carloads, as published in B. & O. R. R. Trf. 236, Ohio No. 6052 (ICC 23190). Revise present rates on, from Cleveland, Ohio, to:

	Proposed Rates (Per Ton
Chardon, Ohio; Clarks, Ohio.	$0.88
Concord, Ohio; Painesville, Ohio; West Fairport, Ohio; Fairport Harbor, Ohio.....	.83

Subject to ExParte 148 increase (suspended).

Docket 76326 (1).—Stone, crushed or crushed-stone screenings, in bulk in open-top cars, and limestone, agricultural, unburned (not ground or pulverized), in bulk, in open-top cars. Establish on, from Pittlime and Barberton, Ohio, to Malta, Ohio, $1.27; Stewart, Ohio, $1.49; Guysville, Ohio, $1.49.

Docket 76332 (2).—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds. Establish rate on, from Ste. Genevieve, Mo., to Tecumseh, Mich., of $3.14 per net ton.

Docket 76332 (1).—Crushed stone and crushed-stone screenings, carloads. To cancel present rate of $0.45 per net ton from Monon, Ind., to C. I. & L. Ry. stations, viz.: Lee, McCoysburg, Pleasant Ridge, Rensselaer, Surrey and Parr, Ind., and reinstate prior rate of $0.55 per net ton.

Docket 76335 (2).—Limestone, ground or pulverized, carloads, minimum weight 60,000 pounds. To establish on, from Kaylor, Pa., to points in Pennsylvania, as shown in Exhibit "E."

Docket 76360 (2)—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel in open-top cars only, carloads. Establish on, from Dundee, Ind., to Markleville, Ind., rate of $0.83 per net ton.

Docket 76281 (Sup. 1 to W. D. A.).—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds.—W. D. A. 76281, D. B. 3247, dated August 1, 1944, covering proposal to establish rate of $5.01 per net ton, from Piqua, Ohio, to New York, N. Y., is hereby withdrawn from docket on request of proponent.

Docket 76335 (Sup. 1 to W. D. A.).—Limestone, ground or pulverized, carloads, minimum weight 60,000 pounds—W. D. A. 76335, D. B. 3248, dated August 11, 1944, covering proposal to establish rates on, from Kaylor, Pa., to points in Pennsylvania, is hereby withdrawn from docket, account this proposition covered by W. D. A. 76054 Dkt. 51092, D. B. 3241, dated June 20, 1944.

Docket 76397 (1).—Crushed stone, in bulk, in open-top cars, carloads. Establish on, from North Vernon, Ind., to Buckskin, Ind., $1.32 per net ton.

Docket 76410.—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds. Establish on, from Worthington, Pa., to Fairchance, Pa., $1.76; Gratztown, Pa., $1.45; Jacobs Creek, Pa., $1.49; Leckrone, Pennsylvania, $1.76; Mt. Pleasant, Pennsylvania, $1.65 per net ton, subject to ExParte 148 increase (suspended), via B. & O. direct.

Docket 76428 (1).—Slag, commercial, crushed (a product of iron and steel blast or open hearth furnaces) in open-top cars, carloads. Establish on, from Hamilton, Ohio, to Bath, Ind., $0.83; Raymond and Peoria, Ind., $0.88 per net ton.

Docket 76440 (2).—Agricultural limestone, unburned, not ground or pulver-

ized, in bulk, in open-top cars, carloads. Establish on, from Speed, Ind., to stations in Illinois on Southern Ry., rates as shown in Exhibit A.

When a shipper orders a car of not less than 60,000 pounds marked capacity and the carrier is unable to furnish a car of capacity ordered by shipper and for its own convenience furnishes a car of greater capacity than the one ordered, the car so furnished will be used on basis of minimum carload weight of 90 per cent. of the market capacity of car ordered.

In no case will orders be accepted from cars of less than 60,000 pounds marked capacity.

From Valmeyer and Prairie du Rocher, Ill. To — destinations in Minnesota. Proposed—Establish rates based on the same mileage scale that was used in arriving at rates from Alton, Pearl, Ill., Cannon and Louisiana, Mo.

Docket E-41-177.—Stone, viz.: Flintstone linings (silex linings), minimum weight marked capacity of car, from Jasper, Minn., to destinations in Illinois and Missouri listed in Item 1180 of G. N. Ry., GFO No. 610-J. Proposed—To Alton, Ill., $0.17; Cario, Ill., $0.23; Elco, Ill., $0.23; Hannibal, Mo., $0.15; Olive Branch, Ill., $0.23; Oregon, Ill., $0.15; Ottawa, Ill., $0.15; Prospect Hill, Mo., $0.17; St. Louis, Mo., $0.17; Tamms, Ill., $0.23; Wedron, Ill., $0.15. (By shipper.)

Docket E-41649.—Limestone, crushed or ground, carloads, minimum weight 90 per cent. of marked capacity of car except that when actual weight of shipment loaded to full visible capacity of car is less than 90 per cent of marked capacity of car, the actual weight will be the minimum weight, but in no case shall the minimum weight be less than 40,000 pounds in open top cars; or 50,000 pounds in cars other than open top or tank cars (see note below). From Valmeyer and Prairie du Rocher, Ill., to Albert Lea, Minn. (Group 18), Faribault, Minn. (Group 19), Mankato, Minn. (Group 20), and points in Minnesota taking same basis as per Column 7, W. T. L. Territorial Directory No. 1-C. Proposed— Publish specific rate of $3.35 per net ton from Valmeyer, Ill., and $3.40 per net ton from Prairie du Rocher, Ill., to Groups, 18, 19 and 20.

Note—When a shipper orders a car of not less than 60,000 pounds marked capacity and the carrier is unable to furnish a car of capacity ordered by shipper and for its own convenience furnishes a car of greater capacity than the one ordered, the car so furnished will be used on basis of minimum carload weight of 90 per cent. of the marked capacity of car ordered. In no case will orders be accepted for cars of less than 60,000 pounds marked capacity. (By shipper.)

Docket E-41-650.—Limestone, crushed or ground, carloads, minimum weight 90 per cent. of marked capacity of car except that when actual weight of shipment loaded to full visible capacity of car is less than 90 per cent. of marked capacity of car, the actual weight will be the minimum weight, but in no case shall the minimum weight be less than 40,000 pounds in open-top cars, or 54,000 pounds in cars other than open-top or tank cars. (See note below.) From Valmeyer and Prairie du Rocher, Ill., to Isabel, Faith, Hecla, Ordway, Pierre, Edgemont, Deadwood, S. D., Marmarth, Linton, Edgeley, Brampton, Fairmount, Fargo, New England and Wahpeton, N. D. Proposed—To establish specific

. . . for

Low Cost Water

• The "Certified" tag on every Carver Pump is your assurance of top performance on the job. It's the kind of performance that means more water at less cost. Each pump is thoroughly tested so that you will get full capacity right from the start and keep on getting it, on tough jobs or easy ones, with less time out for maintenance and repairs.

Available from 1½" to 10", 5,000 to 200,000 gallons per hour. For details, see your nearby Carver distributor or write direct.

THE CARVER PUMP CO. Muscatine, Iowa

CARVER CENTRIFUGAL Certified PUMPS

commodity rates on basis of the scale shown below, such rates to be predicated on short lines mileages computed via short workable routes not to exceed two lines, except where it is necessary to have three lines to make a complete route:

(Rates in cents per 100 pounds)

Miles	*Rates*	*Miles*	*Rates*
80	8½	400	14
90	8½	450	15
100	8½	500	17
115	9	550	18
130	9	600	19
145	9	650	20
160	9	700	21
175	10	750	22
200	10	800	23
225	11	850	24
250	11	900	25
275	12	950	26
300	12	1000	27
325	13	1050	28
350	13	1100	29
375	14	...	..

The above basis to apply for both single and joint line hauls and when approved, rate check is to be held to check specific rates for publication.

Note—When a shipper orders a car of not less than 60,000 pounds marked capacity and the carrier is unable to furnish a car of capacity ordered by shipper and for its own convenience furnishes a car of greater capacity than the one, ordered, the car so furnished will be used on basis of minimum carload weight of 90 per cent. of the marked capacity of car ordered. In no case will orders be accepted for cars of less than 60,000 lbs. marked capacity.

Docket E-41-651.—Limestone, ground or pulverized, unburned, carload, minimum weight 60,000 pounds, from Hannibal, White Bear, Mo., Marblehead and Quincy, Ill.

To	*Proposed*
Bellefontaine, Ohio, Continental, Ohio, and Delphos, Ohio	$3.03
Crawfordsville, Ind., Green Castle, Ind., Limedale, Ind., and Vincennes, Ind.	2.37
Bowling Green, Ohio, Fostoria, Ohio	3.25
Decatur, Ind.	2.92
Frankfort, Ind., and Oakland City, Ind.	2.48
Gas City, Ind., Jonesboro, Ind. (C. & O.)	2.70
Huntingsburg, Ind., Martinsville, Ind., Mitchell, Ind., and Tipton, Ind.	2.59
Pemberville, Ohio	3.36

Illinois Freight Association

Docket IRC 511-176 (EC Dkt. 3401)—Sand and gravel, carload, from Bloomington, Ill., to Curran, Ill. Present: No through rate in effect. Proposed: $0.85 net ton.

Docket IRC 511-177 (EC Dkt. 3400)—Sand and gravel, carload, from Bloomington, Ill., to Taylorville, Ill. Present: No through rate in effect. Proposed: $0.88 net ton.

Docket IRC 511-187-A—Sand (except blast, engine, foundry, glass, moulding or silica) and gravel, carload, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight applies from Forreston, Ill., to Springfield, Ill. Present—$1.39 net ton. Proposed—$1.24 net ton.

Docket IRC 511-201—Gravel; sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, moulding or silica), in open top cars; to cancel present rate of $1.17 per net ton from Munger, Ill., to Decatur, Ill., account no movement.

HERE'S WHAT YOU NEED . . .

The DIXIE Non-Clog HAMMERMILL

for higher Crushing Efficiency

HERE'S WHY YOU NEED IT . . .

You've got to keep up with rapidly increasing demands for crushed rock—a basic need of industry and the armed forces.

The DIXIE Hammermill with its *exclusive* moving breaker plate guarantees continuous high feed and record production on any kind of material handled.

The DIXIE eliminates costy delays, reduces power and maintenance requirements, and combines maximum capacity with high product uniformity.

HERE'S WHERE YOU CAN GET IT . . .

in 40 sizes, for fine, medium and coarse reduction.

DIXIE MACHINERY MFG. CO.
4202 Goodfellow Blvd., St. Louis, Mo.
Please send free booklet on Dixie Non-Clog Hammermills. We want to crush .....
Name .....
Company .....
Address .....
City .....State.....

Southern Freight Association

Docket 32116 (shipper; suggested by carrier)—Establish rate of $1.25 net ton on sand, carload, minimum weight marked capacity of car, except, when car is loaded to full visible or cubicle capacity, actual weight shall govern, but not less than 90,000 pounds from Bostic Yard, N. C., to Steinman, Clinchco, Nora, Wakenva and Dante, Va. Proposed rate to be published to meet motor truck competition and to expire 12 months after publication unless sooner cancelled, changed or extended.

Southwestern Freight Bureau

Docket 34625 (1) — Sand, carload, Crystal City, Festus and Sand Pit, Missouri, to Alabama points. To establish a rate of $2.55 per net ton on sand, carloads, from Crystal City, Festus and Sand Pit, Mo., to Bessemer, Birmingham, Boyles, East Birmingham, Ensley, North Birmingham, Tarrant, Thomas, Woodlawn and Woodward, Ala.

Docket 34642 (1)—Silica sand, Guion, Ark., to Rogers, Ark., to establish rate of $1.85 per ton of 2,000 pounds on silica sand in carloads in box cars from Guion, Ark., to Rogers, Ark.

Docket 34714 (2)—Agricultural limestone, Ill., points to points in Mo. To provide for the application of the distance scale of rates published in Item 1730-C of S. W. L. Tariff 162-S, on agricultural limestone, having value only for soil treating purposes, carloads, minimum weight as shown in Item 180 of S. W. L. Tariff 162-S, from Illinois origins on the Alton R. R. C. B. & Q. Mo. Pac. and Wabash named in Item 1565-A of SWL Tariff 162-S, also East St. Louis, Ill., on the Alton RR, CB&Q., CRI&P., MKT., Mo. Pac., St. L.-S. F., T. R. R. A. of St. L., and Wabash to stations in Mo.

Docket 34758 (1)—Mixed shipments of cement, lime, plaster, etc., Portland, Colorado, to Texas. To provide for the application of Item 40 of S. W. L. Tariff 270 in connection with rates published in Item 1370, from Portland, Colorado, to C. R. I. & P. destinations in Texas, Benonine to Exit, inclusive, on mixed shipments of cement, lime, plaster, plaster board and stucco, minimum weight 50,000 pounds.

Trunk Line Association

Docket 42486 (shipper) — Limestone, ground or pulverized, and/or stone dust, carload, minimum weight 60,000 pounds, to Donaldson, Bolair, Jerryville, Gauley River Mine No. 2, Belin, Main Fork, Jones Camp and Scotti Junction, W. Va., on the B&O R. R. Cherry River Boom and Lumber Branch, from Snow Flake, W. Va., $2.59 and from Buchanan and Rocky Point, Va., $2.92 per net ton, in lieu of present 6th class rate of $5.80, minimum weight 50,000 pounds. Reason: Comparable with rates applying from and to other points.

Docket 42490 (shippers)—To revise rates on crushed stone and stone screenings as publishd in W. Md. Ry. Tariff, I. C. C. No. 8752, from Bittinger, Pa., to various points on the B. & O. R. R. and P. R. R. as per exhibit, copy of which will be furnished on request, rates reflecting the joint Lycoming scale. Reason: to place rates on generally recognized basis for this traffic.

Docket 42491 (shipper)—Sand (other than ground or pulverized), in closed cars, or in tank cars, and sand, molding, bonded (naturally or otherwise), in open top cars, closed cars, or in tank cars, minimum weight 90 per cent. of marked capacity of car, etc., orders not accepted for closed or open top cars of less marked capacity than 60,000 and 80,000 pounds, respectively, from Cumberland, Md., to Wittmer, Pa., $1.87 per net ton, in lieu of present rate of $1.98. Reason: Comparable with rates applying from and to other points.

Western Trunk Line

Docket X-E-41-653—Sand, viz.: Blast, core, engine, filter, fire, furnace, foundry, glass, grinding or polishing, moulding or silica, from Portage and Browntown, Wis., to Kalo, Ia. Proposed—$2.53 per net ton. (By shipper.)

Sup. 1 to E-41-651—Please refer to application No. E-41-651 covering limestone, ground or pulverized, unburnt, carload, from Hannibal, White Bear, Mo., Marblehead and Quincy, Ill., etc., to C. F. A. destinations, as shown in Application Bulletin dated September 6, 1944, and amend same to include Pearl, Ill., Louisiana and Cannon, Mo., as origin points.

Docket E-41-655—Sand, carload, from Hager and Maiden Rock, Wisc., to Oregon, Ill. Proposed—To provide for the application of the rate of $1.43 per net ton on shipments destined "south of the Ohio River" as explained in Items 30 of WTL Tariff No. 5-T and 35 of WTL Tariff No. 1-C. (By shipper.)

Docket E-41-656—Limestone, crushed or ground, carload, from Valmeyer and Prairie du Rocher, Ill., to stations in Wyoming. Proposed—The same rates as in effect from Alton, Pearl, Quincy, Ill., Cannon, Hannibal and Louisiana, Mo. (By shipper.)

DAVENPORT SAVES $25.00 PER DAY

DAVENPORT LOCOMOTIVES are available in STEAM GASOLINE and DIESEL with ELECTRIC or MECHANICAL DRIVE

Examine the following figures and you'll realize what a Davenport Diesel-Electric can do for YOU in major SAVINGS. Here's what Mr. V. O. Johnston, President of The Lincoln Sand & Gravel Co., says about his Davenport Locomotive: "With reference to the savings effected in the operation of our 44-ton Diesel-Electric Locomotive as compared with steam, the figures are as follows:

STEAM		
5 tons of coal @ $4.50 per ton	$22.50	
Fireman	5.20	
		$27.70
DIESEL		
25 Gallons of Oil @ 8c a Gallon		2.00
Net Savings		$25.70

"We have been operating a ten-hour day the last month or two and the savings are proportionately larger. With steam, of course, we have some expense in coaling up, labor in steaming up, cleaning fires, etc., whereas the Diesel is always ready."

FREE HAULAGE SURVEY

Our engineers will be glad to receive descriptions of your haulage conditions and submit reliable recommendations designed to effect savings for you.

EXPORT OFFICE **BROWN & SITES** 60 Church St., New York Cable Address "Brosites"

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

NEW MACHINERY and SUPPLIES

● Adjustable Joint

A new adjustable joint for spraying systems, of ball and socket design, has been announced by Spraying Systems, 4021 West Lake Street, Chicago. It has a 50 degree nozzle adjustment range in any plane at right angles to the face of

Adjustable Joint.

the joint. Thick socket plates permit a friction grip more than sufficient to hold the nozzle in fixed position no matter how extreme the spraying operation. May be had in brass or steel, and a variety of special steel alloys as required. Various sizes of joints with standard pipe thread can be furnished, such as ⅛", ¼", ⅜", ½", ¾", and 1". Typical applications are found in equipment for washing, rinsing, and paint flow-coating.

Henrick Manufacturing Company, 30 Church Street, New York, are producing a wedge-slot screen which gives greatly improved performance on many screen operations. It is made of profile bars held in position by U-shaped supports. Framing bars such as angles and flat bars are supplied for fixation to all types of equipment, such as vibrators, shakers, screw and drag conveyors, dryers, centrifugals and jigs. Principal applications in the crushed stone, sand and gravel industries are for dewatering and wet classification; also for screening undersize in both wet and dry preparation. The screens are made to fit all types of equipment, both flat and curved, stationary or moving. Descriptive material is available.

More Fines Retained, with Low, Uniform Moisture Content— Eagles Do It!

Eagle Dehydrators and Classifiers are correctly designed to meet tomorrow's aggregate specifications calling for 50% to 70% more fines in concrete sand, and at the same time deliver a dehydrated finished product with a moisture content of 9-10%, when handling material above 100 mesh, by actual tests. Slightly higher content with mesh below 100. Eagle has been keeping pace with standards for concrete. Operators should prepare now to meet postwar specifications.

Eagle Dehydrators and Classifiers are in service today handling material as high as 350 mesh. All Eagle Classifiers are equipped with adjustable baffles. The only wearing parts which come in contact with the sand are the flights. With these members made of the proper metal, long service life is obtained from them before replacement is necessary. The Eagle screw dehydrator pictured gives the material a very thorough washing, due to the turning and squeezing action exerted on the material as it is conveyed up to the discharge.

As our experience teaches that it is hardly possible to build a standard tub to take care of all individual conditions, our recommendation on dehydrators and classifiers is that the installation be treated strictly as an engineering problem and the unit be more or less special with regard to the r.p.m. of the screw and the design of the tub.

Send for Catalog No. 44 and tell us about your requirements.

●

EAGLE IRON WORKS
133 Holcomb Ave.
Des Moines, Iowa

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS
EAGLE IRON WORKS
DES MOINES, IOWA
"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

● Dozer Control Unit

A new power control unit auxiliary drum for use with the D4 Towing Winch made exclusively for the "Caterpillar" D4 tractor. While especially designed as a bulldozer power control unit, the new auxiliary drum provides many additional hoisting and towing services

Dozer Control Unit

with the "Caterpillar" D4 or R4 tractor. Simple, quick acting and with only one lubricating fitting it presents no service problem. The single control lever is conveniently located alongside the driver, offering finger-tip response for lifting or lowering the blade. The high-grade, cast iron drum has more cable capacity to reach out farther, increasing its range of usefulness. A positive-working drum ratchet is provided for boom topping service and for holding loads suspended. A protected brake and clutch are located high above contact with road dirt. Driving mechanism requires no lubrication attention, being taken care of entirely from the winch transmission. The D4 PCU auxiliary drum and D4 towing winch, when combined as one unit fulfills all requirements for bulldozer operation—plus heavy duty towing and multiple hoisting services. Manufactured by The Hyster Company, Portland, Oregon. A descriptive folder on this unit is available.

● New Drier

A new type of drier, to be called the Link-Belt Multi-Louvre drier, is announced by the Dryer Division of Link-Belt Company, Chicago, for the low cost drying (or cooling) of bulk materials which do not require long retention periods.

The new drier is described as a very compact, fully-inclosed unit, containing moving louvres supported on power-operated endless chains. The function of these moving louvres is to present the material as it flows, to secure the most efficient drying (or cooling) action.

This mixing action and thorough contacting of the material with the heated air introduced into the unit is said to promote efficient drying and assure a uniformly dry material. The air which is drawn in through the moving mass of material and exhausted at the top of the drier can be heated to the temperature best suited to the material being dried.

(VOTE FOR SIX)

☒ NAYLOR for high pressure hydraulic lines

☒ NAYLOR for high and low pressure air lines

☒ NAYLOR for de-watering and drainage lines

☒ NAYLOR for ventilating pipe

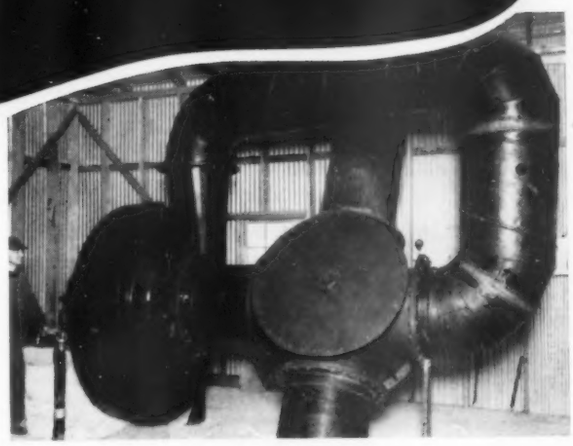
☒ NAYLOR for water supply lines

☒ NAYLOR for sludge lines

☒ Vote for

NAYLOR LIGHT-WEIGHT PIPE

THE MINE OPERATORS' CHOICE FOR THESE IMPORTANT PIPING JOBS



Sizes — 4" to 30" in diameter — thickness from 14 to 8 gauge. All types of fittings, connections and fabrications.

Naylor

LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY

1257 East 92nd Street

Chicago 19, Illinois

with **SECO** VIBRATING SCREENS

Here's Why—When you put a Seco to work, you get 100% efficient gyrating action over every inch of the screen surface. The equalizer assembly assures the same circle throw motion from back to front of the entire screen. There is no distorted motion at the front end of the screen body. This uniformly sharp action of a Seco drives materials more thoroughly and quickly through the meshes and Seco's excellent conveying action keeps the load moving and reduces blinding.

There's a right Seco for your screening problem.

Send for free catalog today! Write Dept. A

SECO SCREEN EQUIPMENT CO., INC.
9 Lafayette Ave. Buffalo 13, N. Y.

Protection from Burn-Outs with

PYRASTEEL

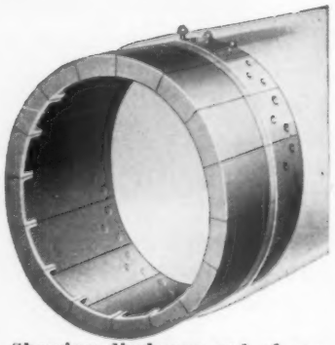
KILN ENDS

Why run the risk of kiln-end "burnouts" that cause serious shutdowns and costly repairs:

Play safe by installing PYRASTEEL Segmental Kiln Ends at both the *discharge end*, as illustrated . . . and also at the *feed end* of your cement kilns.

PYRASTEEL gives long and dependable service at high temperatures . . . as proved in scores of installations throughout the industry.

Write for Bulletin of this Heat-Resisting Alloy



Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

Unit segments are easy to install or replace

CHICAGO STEEL FOUNDRY COMPANY
KEDZIE AVE & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years
PYRASTEEL for high temperatures
EVANSTEEL for strength

● Steel Apron-Feeder

The Pioneer Engineering Works, Inc. of Minneapolis has been authorized by the Kensington Steel Company of Chicago to build the Oro manganese-steel apron-feeder.

The Kensington Steel Company holds the patents on this feeder which has several outstanding features. All wearing parts, including pans, rollers, chain bushings, and sprocket teeth are of manganese steel. The sprockets on both head and tail shafts are built with reversible and renewable teeth made of Oro manganese steel. They can be easily reversed and replaced without removing the sprocket centers from the shaft or disconnecting the pans.

Apron-Feeder

Sizes range from 30 to 60 inches wide. Lengths vary from 6 to 25 feet, depending on the installation. The pitch of the pans is 6 and 9 inches on the smaller feeders, and 12 and 15 inches on the larger feeders.

The Pioneer-Oro manganese-steel feeders will be sold by Pioneer distributors in the United States and all foreign countries.

A new standard line of self-contained automatic recirculating clarifiers was recently brought out by The Briggs Clarifer Company, 1339 Wisconsin Avenue N. W., Washington, D. C. Known as the Dru Series, it was designed to solve a specific oil filtration problem. The unit is completely self-contained with electrically operated pumps and heaters which operate independently of the engine or lubricating systems and thus can be adapted to any engine, no matter how difficult the system may be to fit. It is said to be especially suited for Diesel, gasoline or natural gas engines where operating temperatures are too low or pump capacities are inadequate for filtration efficiency. The Dru Series is composed of a standard by-pass clarifier, with dual rotary positive displacement pumps and electric heater installed in the base beneath the clarifier.

The appointment of A. C. Quinn as District Sales Manager for the Southwest has just been announced by Diamond Iron Works, Inc., Minneapolis, manufacturer of crushing, screening, washing, and conveying equipment. Mr. Quinn will cover the states of Kansas, Western Missouri, Colorado, Oklahoma, Texas, Arkansas, New Mexico, Louisiana, and Arizona, and will have his headquarters for the time being with Herd Equipment Company, Diamond distributors in Oklahoma City, Oklahoma.

• New Crusher

A new crusher, revolutionary in construction and operation, is being presented to the mineral industries by two companies. E. R. Ebersol, the inventor, has licensed the Barber-Greene Company of Aurora, Illinois, as exclusive manufacturer of his crusher for use in portable plants, while his company, the Ebersol Crusher & Engineering Company, Lancaster, Pennsylvania, retains the manufacturing rights for machines to be used in permanent installations in the quarry and mining fields.

The Ebersol crusher combines and utilizes several fundamental stone-reduction principles to increase capacity, efficiency, economy, and versatility. It is a complete two-stage, four-speed jaw crusher operated with only one main shaft. The upper and lower jaws are composite elements having identical action, but constructed to function as distinct primary and secondary crushers. Likewise, their reduction ratio is said to be comparable to that of the conventional and widely used two-unit outfits employing separately propelled jaw and roll crushers.

In the Ebersol crusher the main jaw, moved by the eccentric shaft, travels in a nearly circular path as illustrated by the right half of Figure 1; while the opposing jaw, shown at the left, moves up and

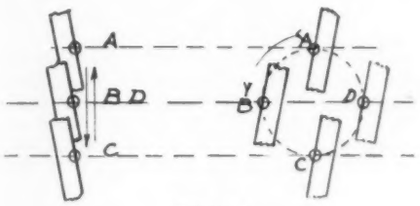


Figure 1.

down in a strictly vertical path. Thus, the material is carried downward at the same time that it is being crushed by the pressure of the main jaw against the other jaw. The jaws start to move away from each other at the moment of their greatest downward acceleration, as shown by the position marked "B" in Figure 1, thus, delivering the material to gravity under momentum imparted by the downward movement of both jaws.

The motion of the two jaws with relation to each other is well indicated by the four positions illustrated in Figure 2. Here position "A" shows both jaws at the top of their stroke. The main jaw, shown at the right of each pair, is just beginning to clinch the material. In position "B" both jaws are moving downward together and are in their most nearly closed position. Position "C" shows both jaws at the bottom of their stroke, the main jaw beginning to move away from the other jaw and releasing the crushed material while it still has downward velocity. In position "D" both jaws are returning upward, the distance between the jaws being now at its maximum, thus facilitating the reception of a new batch of uncrushed material.

As is shown in the cross-section view (Figure 3) the upper, or primary, jaws can be adjusted independently of the lower, or secondary, jaws. There is provision also for splitting one of the lower, or secondary, jaws in the center of its

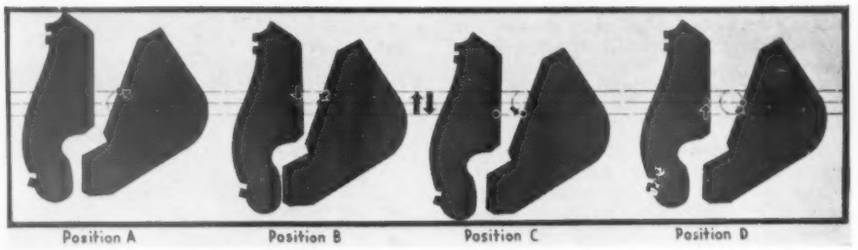


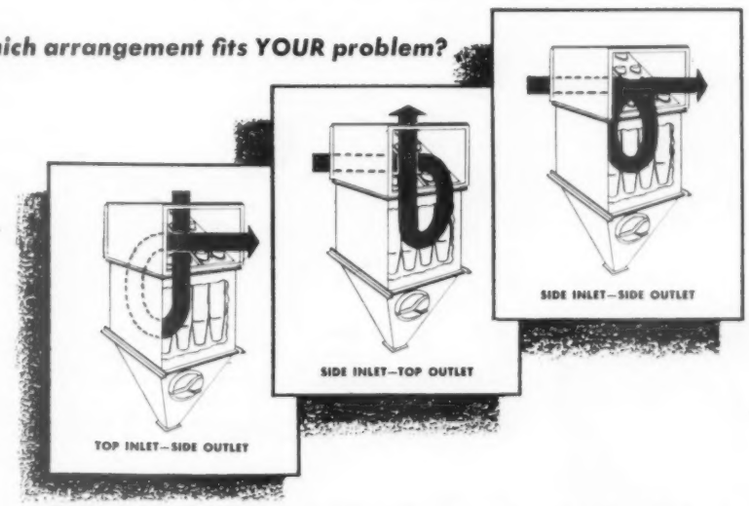
Figure 2.

of rest or without downward impetus. Because of this, the inventor says, there is a certain speed above which such crushers can not operate; since the jaws would be coming together again before gravity has had time to overcome the inertia of the material and move it farther down in the crusher. In the Ebersol crusher the faster the jaws operate, the faster the material drops, with consequent higher capacity, it is said.

The principle of moving both jaws

THE MULTICLONE IS ADAPTABLE TO YOUR SPACE REQUIREMENTS

Which arrangement fits YOUR problem?



MULTICLONE Collectors for the collection of dust, fly ash and other suspended particles from gases offer *many* basic advantages . . . one of which is their ability to fit into "shoe-horn" spaces—areas too small for other equipment—waste spaces with low headroom or tight side clearances.

Where low headroom is a factor the MULTICLONE can readily be installed with side inlet-side outlet to minimize vertical height. Or where side clearance is a factor, side inlet-top outlet or top inlet-side outlet installations can be made.

In addition, MULTICLONE'S exclusive vane tube eliminates multiple inlet and outlet ducts. Many tubes can be compacted into one unit with only a *single* inlet and outlet header required. Moreover, tubes may be fitted together in various arrangements to fit cramped spaces . . . and only one discharge hopper is required to handle the collected material from an entire bank of tubes—not the conventional separate hopper for each tube.

All these features add up to unusual compactness and adaptability. But the MULTICLONE has many other vital advantages, too. Get the full story on how it is simpler to install, easier to maintain and gives higher efficiency. Send for this booklet!

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 140 S. DEARBORN ST., CHICAGO 3
HOBART BUILDING • SAN FRANCISCO 4, CALIFORNIA
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

width, thus enabling the crusher to produce through one-half of its width a 100 per cent. fine material, while the other half can be set to a large opening and produce a very coarse material at the same time.

A screen between the primary and secondary jaws removes the fines created at the primary crushing chamber (primary stage) and allows them to by-pass the secondary jaw. This relieves congestion in the secondary chamber (secondary stage) providing far more void space than would otherwise exist at the throat of the crusher, and allowing, therefore, a much closer setting without danger of packing at the discharge end. An Ebersol crusher measuring 15 inches between the jaws and the top can safely operate, it is said, at a discharge opening of ⅝ inch on the closed stroke. This is a ratio of reduction of 24 to 1.

The opposing jaw moves up and down in unison with the main, or eccentric, jaw during all phases of the crushing circuit. This is made possible by the use of the connectors fastened on opposite sides and linking the main (rotating) jaw head with the opposing jaw head. These outside connectors are attached at a sufficient angle so that they become the equivalent of pitmans transforming the rotary movement of the eccentric jaw into a vertical reciprocating movement in the opposing jaw.

Since the main eccentric shaft runs through its approximate center, the main jaw head travels in a near circle with every revolution of the flywheel. Pressure at the top and the bottom of the jaw is equalized, and the stroke is, therefore, said to be uniform. The weight of the Ebersol crusher's pitman jaw revolves with the eccentric shaft so that there is not a reversal motion of a heavy member. To hold the rotating jaw in place long arms extending from the top to the bottom of either side converge at a point well ahead of the jaw assembly where vertical leaf springs absorb the resultant rocking action.

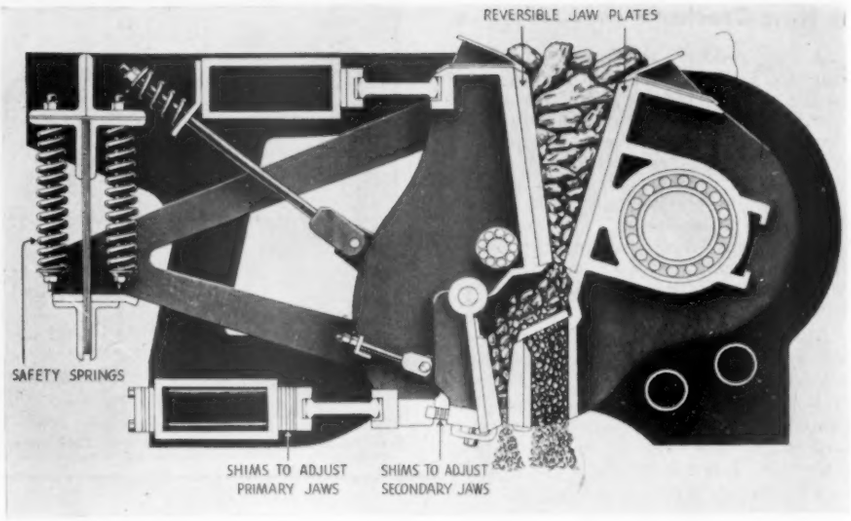


Figure 3.

The force-feed principle of the Ebersol crusher results from the combined action of the jaws. The jaws open and "reach up" to grasp and pull down the incoming stones. Closing together as they move downward, the jaws crush the stones, and finish the crushing cycle by giving them forced velocity at the end of the stroke. When the stroke is complete the jaws begin separating to release the crushed material. At that instant both jaws and stones are descending at their highest rate of speed. Actually, the stone is said to be "thrown" downward as the stroke recedes.

Because there is no absolute dependence on gravity to feed this crusher, there is no limiting factor such as stone flow. Consequently, it is said, it can operate at the speed that produces the highest degree of efficiency. The fact that the up-and-down movement of the two jaws of the Ebersol crusher is synchronized and the fact that they travel in the direction of the material flow are said by the inventor to make it possible to crush the stone by pure pressure alone and without rubbing and abrasion. This, it is said, reduces the amount of power required for operation and reduces wear of the crusher jaws.

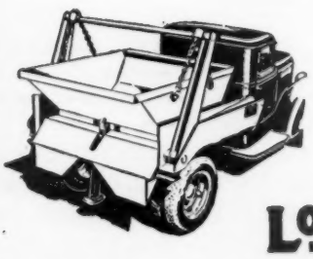
To make possible free up-and-down movement the opposing jaw is attached to the main frame by two plate-like rocking toggle links, one at the upper end of the primary jaw and one at the lower end of the secondary jaw, as shown in Figure 4. They are roll face and anti-friction in action. The renewable liners are made from high-carbon steel.

The crusher is provided with an overload release at the vital point of the secondary jaws where foreign objects too hard to crush usually become lodged. These secondary jaws are protected by a bank of coil springs at the forward end of the extended arms. When tramp iron finds its way into the jaws the springs will keep giving—through a force lever application—until the piece drops out or until the crusher can be stopped.

The Barber-Greene portable plant (Figure 5), which incorporates a crusher of the type just described, consists of a feed hopper, a feeder, a live grizzly, an Ebersol 15- by 24-inch crusher, a main conveyor, a rotary elevator, a two-deck sizing screen, two truck-loading conveyors, and a dirt-reject conveyor. This plant, plus a power unit and all the necessary accessories, is mounted on one semi-trailer, ready in a few minutes to move around in a pit or quarry, or to travel 25 miles an hour on the road. Although this

For LOADING For HAULING For DUMPING

E-L-E-C-T-E-D !
on the "Economy Ticket"



Brooks LOAD LUGGER

ANY nation-wide poll of production men will show the popularity of Brooks LOAD LUGGER for any material handling jobs, where loading is done by hand labor.

This hydraulic hoisting unit mounts on a standard chassis, and operates with 5 to 10 dump buckets, hauling and dumping continuously. This system saves manpower, reduces maintenance and speeds up the work.

Also available with Brooks TrucKrane boom attachment for lifting and placing pipe, tile, beams, etc. Use the LOAD LUGGER combination unit for construction jobs, quarry operations and road building work.

Ask for Catalog #44

Davenport Road, Knoxville 8, Tenn.
Distributors in all Principal Cities

Brooks EQUIPMENT AND MFG. CO.

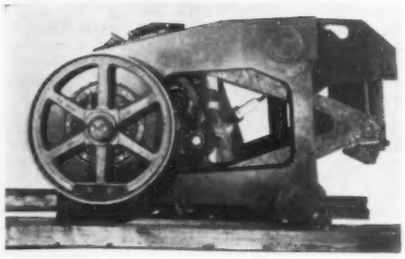
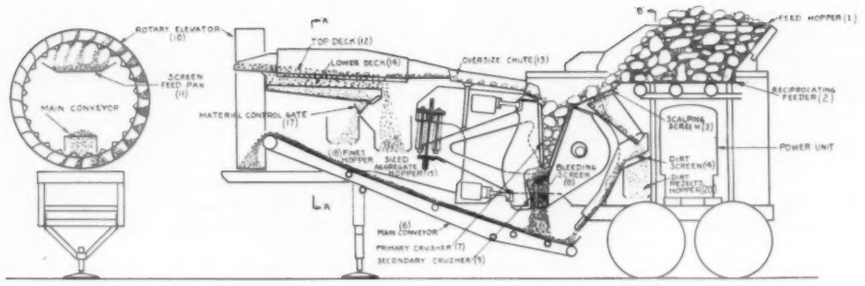


Figure 4.



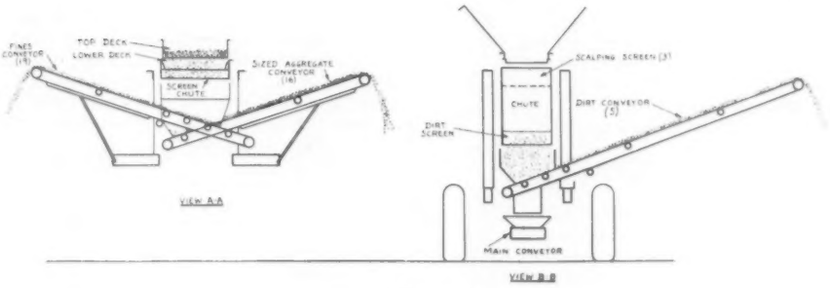


Figure 6.

plant is an Army model and commercial plants, now in process, will be somewhat different, it is suitable as it is for many applications.

The crusher is built to take rock 15-by 24-inches or under and reduce it to pass a ⅝-inch screen. The crusher jaws can be quickly adjusted from ⅝ inch to 3 inches at the discharge end.

The plant's capacity is 25 to 35 cubic yards per hour, passing a 1¼-inch square-mesh screen. Capacities up to 50 cubic yards or more per hour are attained in gravel production, or in stone passing larger screen sizes. The capacity is less when crushing stone smaller than the 1¼-inch size, since the screen then used is smaller.

The complete cycle of operation is shown on the material flow sheet (Figure 6). Beginning at the feeder, raw uncrushed material is deposited into the feed hopper (1). The bottom plate of the hopper is powered to reciprocate toward and from the crusher and serves as a reciprocating feeder (2). It thus moves and feeds the material from the hopper to the scalping screen (3) and thence into the crusher throat.

The scalping screen allows small stones and fines to pass through, thence into a chute that directs them to a dirt screen (4), where dirt and sand are removed from good, usable stone and fall on the dirt conveyor (5 in view B-B). The stone continues down the chute to the main conveyor (6). The scalping screen, dirt screen, and adjoining chutes are fastened to the crusher's moving jaw head, which is driven by the eccentric main shaft.

Stone fed into the crusher is pulled down and reduced by the force-feed action of the crushing stroke. Discharged from the upper set of primary jaws, constituting the primary crusher (7), the crushed rock rolls over a short bleeding screen (8). Here most of the fines pass through the main conveyor belt (6) below. Stone rolling off the bleeding screen enters the lower set of jaws, or secondary crusher (9), where it is crushed to the desired size and discharged on the main conveyor.

Thus, usable material is discharged through three outlets to the main conveyor, which carries all the material upward and forward to the rotary elevator (10), which has the appearance of a waterwheel turned outside in. The rotary elevator in turn deposits the crushed stone on the screen-feed pan (11) of the top deck of the sizing screen.

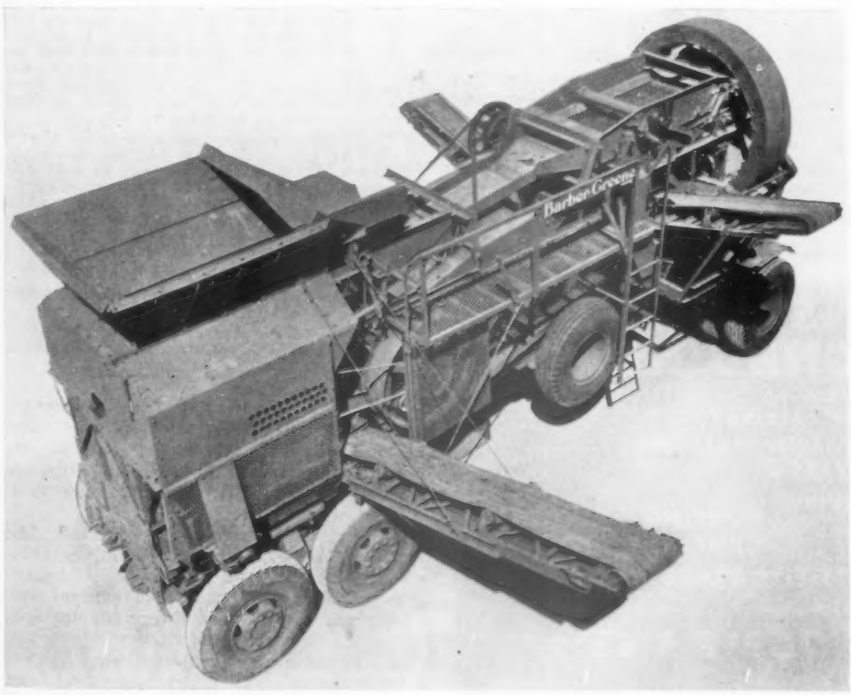


Figure 5.

IT COSTS NO MORE TO USE THE BEST

REPLACE WITH
"Indian Brand"

Shovel Dippers
Dipper Teeth
Shovel Treads

Crusher Jaw Plates
Mantles—Concaves
Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

The top deck (12) and the lower deck (14) constitute the sizing screen, which produces two grades of finished material. Material going through the lower deck passes into a hopper labeled "fines" (18). Sized material from the top deck falls into the hopper marked "sized aggregate" (15). An adjustable material control gate (17) can be utilized to divert all, or any proportion of, the fines to the sized-aggregate hopper.

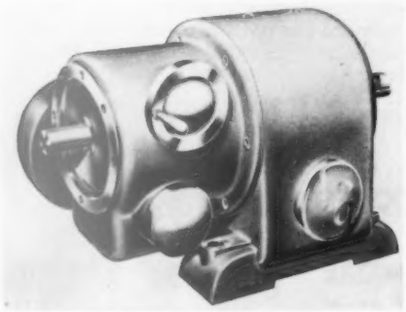
Conveyor hoppers have a small surge capacity, sufficient to allow conveyors to be stopped while changing trucks.

An oversize chute (13) at the discharge end of the top deck carries oversize stone into the crusher throat to be reprocessed.

A glance at view A in Figure 6 will show the position of truck-loading conveyors that deliver material to opposite sides of the machine. On the right is the sized-aggregate conveyor (16) and, on the left, the fines conveyor (19).

New Type Speed Drive

A compact new type variable speed drive that provides quick, sure control of line conveyor methods, particularly in the medium and higher horsepower fields has been announced by Lombard Governor Corporation of Ashland, Massachusetts. Scarcely larger than the motor with which it is used, the complete unit is easy to handle and install. As the gears are totally enclosed and run in oil. The V-Belt is used as a control medium only, primary speed reduction being ac-



complished by conventional gearing methods. Ninety per cent of the power goes through conventional gears, while only 10 per cent passes through the V-Belt. Lower gear ratio affords finer hairline control and insures peak production speeds. As the easily accessible V-belt is the only part to need replacement over a long period of time, low maintenance cost is possible. The variable speed output shaft is furnished concentric with the motor, giving it the advantage of direct line drive.

The Pioneer Enginering Works, Inc. of Minneapolis has been authorized by the Kensington Steel Company of Chicago to build the Oro manganese-steel apron feeder.

The Kensington Steel Company holds the patents on this feeder which has several outstanding features. All wearing parts, including pans, rollers, chain bushings, and sprocket teeth are of manganese steel. The sprockets on both head and tail shafts are built with reversible and renewable teeth made of Oro manganese steel. They can be easily reversed and replaced without removing the sprocket centers from the shaft or disconnecting the pans.

Sizes range from 30 to 60 inches wide. Lengths vary from 6 to 25 feet, depending on the installation. The pitch of the pans is 6 and 9 inches on the smaller feeders, and 12 and 15 inches on the larger feeders.

The Pioneer-Oro manganese-steel feeders will be sold by Pioneer distributors in the United States and all foreign countries.

The Briggs Clarifier Company, 1339 Wisconsin Avenue, N. W., Washington D. C. has brought out an improved standard line of round tank fuel oil filters for Diesel engines. These new models have been added so that flow capacities range up to 500 G.P.H. The clarifiers are designed for maximum working pressure in both small, high-speed and large, heavy-duty Diesel engines.

Three new appointments in the eastern and New England territories are announced by the Diamond Iron Works, Inc., Minneapolis manufacturer of crushing, screening, conveying, and other construction equipment. J. P. Blackman, Medford, Massachusetts, has been appointed factory representative for Pennsylvania, New Jersey, the New England States, and the Eastern Provinces of Canada. Equipment Rental & Sales, Inc., Albany, and Contractors' Syracuse Sales Co., Inc., Syracuse, have become Diamond distributors in their respective territories.

STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1943.

State of Illinois, County of Cook, *ss.*

Before me, a notary public in and for the state and county aforesaid, personally appeared H. W. Baumgartner, who, having been duly sworn according to law, deposes and says that he is the business manager of PIT AND QUARRY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Complete Service Publishing Company, Chicago, Ill.; Editor Stanley A. Phillips, same; Managing Editor, Stanley A. Phillips, same; Business Manager, H. W. Baumgartner, same.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent. or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given).

Complete Service Publishing Company, Chicago, Ill.
Harry W. Baumgartner, same.
Ida A. Baumgartner, same.
Stanley A. Phillips, Evanston, Ill.
Florence S. Phillips, Evanston, Ill.
James E. Montgomery, Chicago, Ill.
Evelyn W. Montgomery, same.
Lanetta B. Smith, Glen Ellyn, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of the total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ..... (This information is required from daily publications only.)

H. W. BAUMGARTNER,
Business Manager.

Sworn to and subscribed before me this 27th day of September, 1944.

(SEAL) RAYMOND S. SCHULTZ,
(My commission expires January 21, 1947.)

W. A. Meyer has been appointed manager of dealer sales of the Allis-Chalmers Mfg. Company, it was announced recently by W. C. Johnson, vice-president. He succeeds S. H. Gorham, who has resigned.

With Allis-Chalmers since 1926, Mr. Meyer has served in the milling machinery, Texrope, and central sales departments, and was manager of general purpose equipment sales before his appointment. He has been particularly active in the field of multiple V-belt power transmission and is vice-president and chairman of the executive committee of the Multiple V-belt Drive association.

POST WAR CONSTRUCTION CAN BE DESIGNED NOW

Types of Projects Solicited

SILOS — "Sliding Form" Method
STORAGE — for all Granular materials
BUILDINGS OF ALL TYPES—
Industrial or Commercial
RETAINING WALLS
RESERVOIRS
PUMPING STATIONS
CEMENT PLANTS

YOU CAN PROFIT BY OUR TWENTY-FIVE YEARS EXPERIENCE

Our engineers and construction crews are available for quick construction.

E. C. MACHIN COMPANY
BUILDERS
Commonwealth Building — Allentown, Pa.

AFTER THE WAR IS OVER

Employment in Post-War Road Construction In the period 1931 to 1942 the amount of labor employed in highway construction averaged 148,457 man-years annually, according to Thomas H. MacDonald, commissioner of Public Roads Administration. Essential state maintenance in the same period required an annual average employment equivalent to 133,759 man-years. He estimates that the average annual employment after the war for construction and maintenance will be 327,155 man-years on the former and 460,501 man-years on the latter.

* * *

Cincinnati Has Post-War Committee Citizens of Cincinnati have appointed a Post-war Construction Committee embracing diversified interests in the construction field and having a threefold object. Representatives of labor, home-building interests, plumbing, heating, building-material and allied businesses are members of the committee. A central bureau will clear all construction projects to be undertaken after the war. Created at the suggestion of the Cincinnati Committee for Economic Development, the committee will seek to promote post-war employment through private and public construction, to promote planning and legislation for essential projects, and to provide employment through private contracts and private industry. G. E. Jones is chairman of the committee, Frederick W. Graber is co-chairman, and A. C. Armstrong is secretary-treasurer. Eugene J. Root, former Cincinnati service director, is consulting engineer. All the plans of the city, the school board, the county and those of private origin will pass through his hands.

* * *

War-Deferred Highway Construction State highway departments report that more than $4,600,000,000 worth of highway construction is needed just to catch up on programs deferred by the war, according to Commissioner Thomas H. Macdonald of the Public Roads Administration. For about half of these deferred projects surveys and the preparation of plans were under way or had been completed by June 1. The programs reported include $3,320,000,000 worth of work on rural roads and $1,277,000,000 worth of work of urban routes. State highway departments have completed plans for projects to cost $214,533,000; projects estimated to cost $932,512,000 are being designed; and projects to cost $1,069,415,000 are now under survey for the preparation of designs and working plans. In 1942 the states collected $1,275,335,000 from highway users. Of this amount $729,393,000 went to state highways and $341,777,000 to local roads, and $204,165,000, or 16 per cent., was spent for non-highway purposes.

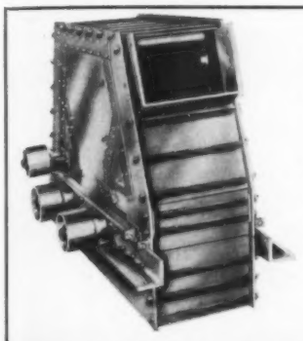
* * *

Public Works Key to Post-War Employment "Will we listen to the voices that condemn post-war planning now that we are at war as intently as we hearkened to the voices that lulled us into unpreparedness for the battles we are now fighting? The answer is in our hands. By intelligent post-war planning we can maintain the economic stability of America and play our proper role in world security; and public works hold the key to full post-war employment."—(Morris M. Conn., editor, *Sewage Works Enginering and Sanitary Engineer.*)

Nevada Magnesium Plant Lays Off 200

Nearly 200 workers are being laid off weekly at the plant of the Basic Magnesium Company near Las Vegas, Nevada, as a part of a gradual curtailment program which will result in the complete closing of Basic's huge operations on December 20 in accordance with a recent decree of the War Production Board.

The lay-offs began October 1 at the plant which had been employing about 4,500 workmen for many months.



This new double-impeller crusher will produce from 100 to 150 tons per hour of material passing 80% through a 1-inch mesh.

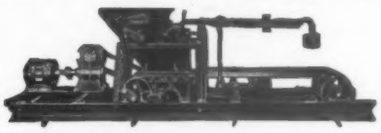
It's compact in design, light in weight (12 tons), and saving in power (from 50 to 75 horsepower drives it). And, above all, it's

Adaptable to portable or stationary work.

Write for complete information.

NEW HOLLAND MACHINE CO.
NEW HOLLAND, PENNSYLVANIA

Over One Thousand



SCHAFFER POIDOMETERS
Designed and Built to Serve Industry
With **SPEED ECONOMY PRECISION**

In hundreds of plants throughout the world the Schaffer Poidometer has displayed the old rule-of-thumb method of proportioning raw and finished materials.

In every instance the change has resulted in greater production, assured uniformity of product and important economy. Schaffer Poidometers are built to stand hard, continuous service. The increased tempo caused by the war emergency has further emphasized their ability to take it.

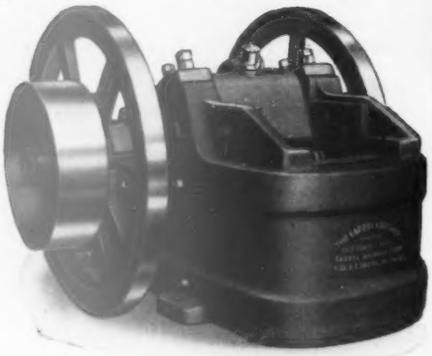
Poidometers can be furnished with recording devices for registering total tonnage handled. Also with remote controls for indicating rate of feed, total amount delivered, and for changing rate of feed.

Write for Catalog No. Five

SCHAFFER POIDOMETER CO.
2828 Smallman St. **Pittsburgh, Pa.**

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.

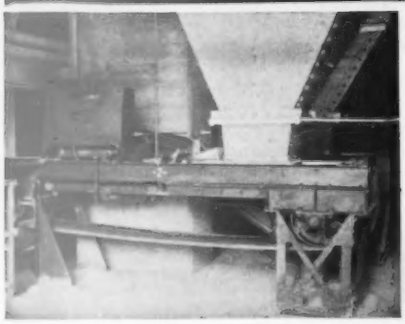


EARLE C. BACON, Inc.
17 John St. New York, N. Y.

The 50,000th power control unit recently was reached in the Peoria plant of R. G. LeTourneau, Incorporated, designers and producers of heavy grading equipment. Shown here proudly inspecting the anniversary unit as it came off the assembly line, are President LeTourneau, left, and G. S. McKenty, general sales manager.

GEORGE J. DIMOND has been appointed sales manager of the Isley Manufacturing Company, to succeed Ray W. Dorward, retired. Before joining Insley, Mr. Dimond was associated with The Hoehring Company of Milwaukee for 25 years.

This is the Dual Purpose WEIGHING MACHINE • MERRICK FEEDOWEIGHT



Feedoweight combines in a single unit a conveyor type feeder and scale
It automatically feeds the material by weight and accurately totals and registers the amounts.
Precision is assured by power-operated feed and control gate.
Two or more materials may be fed in correct proportion, by batch or continuous method, using respective number of Feedoweights.

Write for Information.

Merrick Scale Mfg. Co.
Passaic, New Jersey

PERFORATED METAL SCREENS

FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

Prompt Shipment

CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
Telephone **CANAL 1459**

Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

ANTI-RUST. A small folder setting forth the advantages of a safe, fast, and economical solvent. M. B. Price Associates. Empire State Building. New York City.

THE CHOICE OF BUCKETS. (Catalog) 48 pages. Classifies the different types and their uses. Illustrated. Blaw-Knox Company, P. O. Box 1198. Pittsburgh, Pennsylvania.

CEMENT PLANT BULLETINS. Summarizes operating features of portable cement plants. C. S. Johnson Company, Champaign, Illinois.

SELF-LOCKING NUTS. Catalog and data book. Elastic Stop Nut Corporation of America, Unicn, New Jersey.

THE CARE OF SYMONS CONE CRUSHERS. Booklet. Strictly for the operator. The Nordberg Manufacturing Company, Milwaukee, Wisconsin.

STEARNS CLIPPER STRIPPER. (Bulletin C-1), 4 pages. Stearns Manufacturing Company, Adrian, Michigan.

STEARNS MIXERS. (Bulletin M-1), 4 pages. Stearns Manufacturing Company, Adrian, Michigan.

REX UNI-FLO. (Bulletin 442), 15 pages. Chain Belt Company of Milwaukee.

SPRAYING SYSTEMS. (Catalog 22), 32 pages. On spray nozzles and related products. Spraying Systems Company, 4021 West Lake Street, Chicago.

MIKRO-PULVERIZER. 40 pages. Catalog covers the basic features of construction design and application of every model. Pulverizing Machinery Company, Summit, New Jersey.

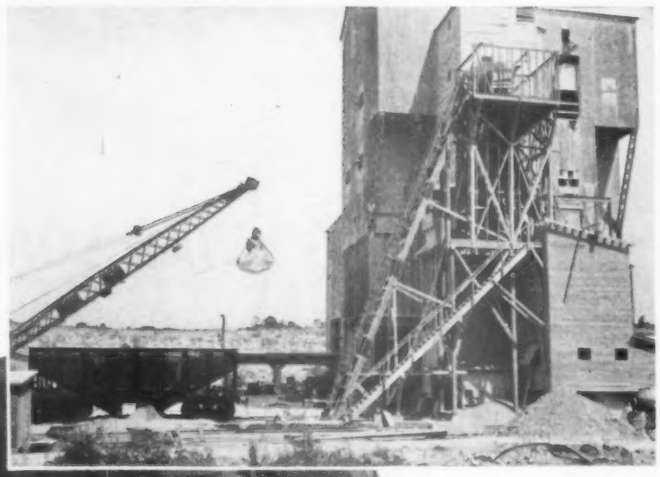
PORTER, DEVINE, QUIMBY—The Complete Line of Better Equipment for the Process Industries. (Illustrated Catalogue) Lists 40 categories of process items, from the smallest agitator to huge vessels. H. K. Porter Company, Inc., Pittsburgh.

LISTING & BATCH SCREENING. (Bulletin 90-A) Universal Vibrating Screen Company, Racine, Wisconsin.

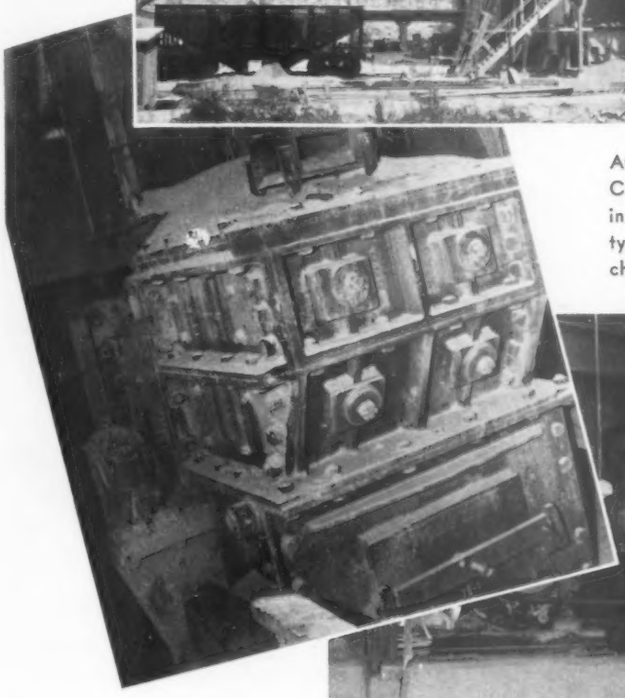
LOW-HEAD HORIZONTAL VIBRATING SCREENS. (Bulletin B6330). Allis-Chalmers Manufacturing Company, Milwaukee.

The American Air Filter Company, Louisville, Kentucky, has announced several changes in its organization. W. G. Frank has been made assistant to the president. H. C. Murphy, vice-president, has ben appointed general sales director, Howard W. Pound will be in charge of the air filter division, and William K. Gregory will direct the special products division of the company.

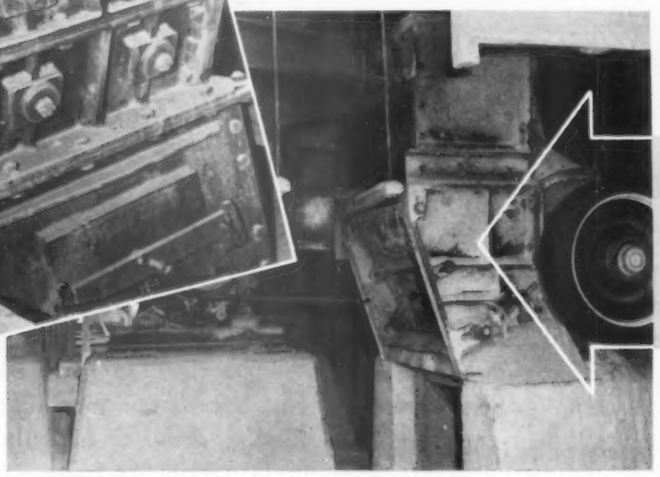
EXPANDING AGSTONE PRODUCTION WITH AMERICAN CRUSHERS



THE PLANT
COLUMBIA QUARRY CO.
Krause, Ill.



At left: American type ACS-3 Crusher with Synchron vibrating feeder. Below: American type 3040 Crusher with Synchron feeder and 75 HP motor.



AND THE CRUSHERS ARE *ALL* AMERICAN

Now another AMERICAN Crusher has been added to this agricultural limestone plant, boosting Columbia's output to 3200 tons per day.

This is the third successive installation of AMERICAN Crushers that Columbia Quarry Company has made for building up production efficiency to meet today's increased demands.

"AMERICANS" are capable of producing any size material from graded stone sand and agricultural limestone to coarse aggregates.

On this job, all three Crushers are delivering finely crushed stone to the screening plant for $\frac{3}{8}$" and minus $\frac{1}{4}$" mesh material as the demand requires. Dependable, economical performance is the reason why Columbia has standardized on "AMERICANS" exclusively.

AMERICAN Crushers are furnished in capacities from 10 to 100 tons per hour of uniform product.

Write for details and prices.

AMERICAN PULVERIZER COMPANY 1059 MACKLIND AVE. ST. LOUIS, MO.

Official U. S. Marine Corps Photo

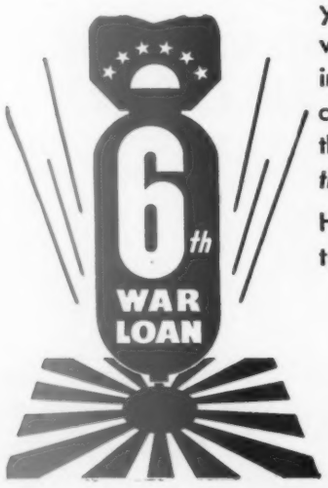
Keep Your Plant's Quota "OUT FRONT!"

Victory depends upon materials—as well as men! To keep our American forces "closing in" overseas, you and every other manufacturer here at home must *keep on making* "Out Front" War Bond Quotas!

This means *action now* on every point in the fighting 8-Point Plan to step up Payroll Deductions. For instance, have you a 6th War Loan Bond Committee, representing labor, management and other important groups in your company? Selected Team Captains yet—preferably returned veterans? If so, have you instructed them in sales procedure—and given each the Treasury Booklet, *Getting the Order?*

How about War Bond quotas? Each department—and individual—should have one! Assigning responsibilities is vital, too! Have you appointed enough "self-starters" to arrange rallies, competitive progress boards and meeting schedules? Are personal pledge, order or authorization cards printed, and made out in the name of each worker? Planning for resolicitation near the end of the drive? Your State Payroll Chairman is ready now with a detailed Resolicitation Plan. And, have you contracted for space in *all* your regular advertising media to tell the War Bond story?

Your positive *Yes* to *all* points in this forward-to-victory 8-Point Plan assures your plant meeting an "Out Front" Quota in the 6th War Loan—and speeds the day of unconditional surrender!



The Treasury Department acknowledges with appreciation the publication of this message by

PIT & QUARRY

This is an official U. S. Treasury advertisement—prepared under the auspices of Treasury Department and War Advertising Council.

Control SAND MOISTURE

with AKINS *Classifiers*

TO CUT TIME & COST IN MIXING

and to make BETTER CONCRETE

NO cement contractor wants variation in the moisture content of the sand he uses — because moisture variation either produces concrete of uneven quality or adds time and cost in mixing — or both. Show him that you can supply sand with uniform moisture and you have something more than sand to sell him.

AKINS Classifiers are well adapted mechanically for controlling moisture and are especially suited to washing sands to close specifications, such as required for glass making. AKINS Classifiers do not require unloading after shutdowns. Power and upkeep requirements are very low, considering the high tonnages handled.

LET US WORK WITH YOU ON POST WAR PLANS.

SKINNER MULTIPLE HEARTH ROASTER

•

LOWDEN DRYERS

•

SMELTING EQUIPMENT

AKINS

COLORADO IRON WORKS Company

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.
Vancouver Iron Works, Ltd., Vancouver, B. C., Can.
Head, Wrightson & Co., Ltd., Stockton on Tees, England
Head, Wrightson & Co., (So. Africa) Ltd. Johannesburg
The Clyde Engineering Co., Ltd., Granville, N. S.W.

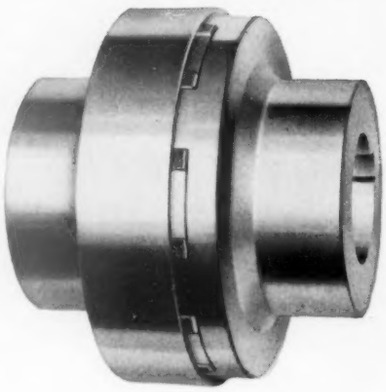
MAIN OFFICE & WORKS: DENVER 2, COLO., U. S. A.

NEW!

L-R SAFEGUARDED COUPLING

PROTECTS MEN and MACHINERY

L-R Type "C"



The coupling with outside steel collar extension. For duties 2.20 to 170 h.p. at 100 r.p.m. Pat. & Pats. Pend.

Entirely new feature. Additional protection from weather, dirt, moisture. Safeguards clothes and fingers. Boltheads are practically concealed, yet readily accessible. More compact design, with overall smoothness reducing even airflow resistance. Another Lovejoy improvement with most dependable correction for misalignment, and take-up of shock and vibration.

L-R FLEXIBLE COUPLINGS

NON-LUBRICATED
EXTREMELY QUIET

NO SHUT-DOWNS FOR CHANGING

Individual, free-floating load cushions (all materials) hung between rugged jaws always in sight for inspection. No shut-downs for changing. Practically service-free.

CATALOG SHOWS FULL L-R LINE

Couplings for every duty and condition, 1/6 to 2500 h.p. Selector Charts enable you quickly to pick couplings for your exact needs. Wire or write

LOVEJOY FLEXIBLE COUPLING CO.
5017 West Lake St., Chicago 44, Ill.

Bigger Bites

...even in wet digging!

WITH THE *Lightweight*

No matter what the digging conditions may be, the Hendrix Lightweight naturally moves more material, and moves it faster! It is a bucket that is light, yet strong . . . easy to handle on small machines or on long booms.

The round perforations which reduce excess weight also serve two other worthwhile purposes: Eliminate vacuum to insure quick, clean dumping, and in wet digging full loads are maintained for the water remains in the pit.

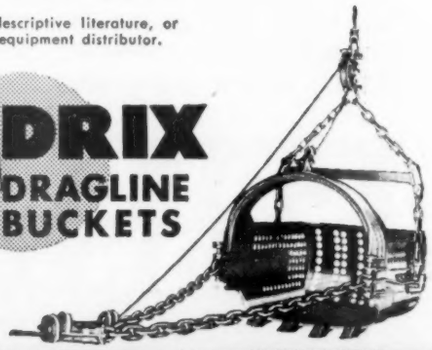
★ ***3 TYPES, 3/8 to 30 CUBIC YARDS***
Light, medium and heavy duty.

★ ***20% to 40% LIGHTER THAN OTHER BUCKETS***
Permits greater ease of handling.

★ ***ALL-WELDED CONSTRUCTION***
No rivets to work loose.

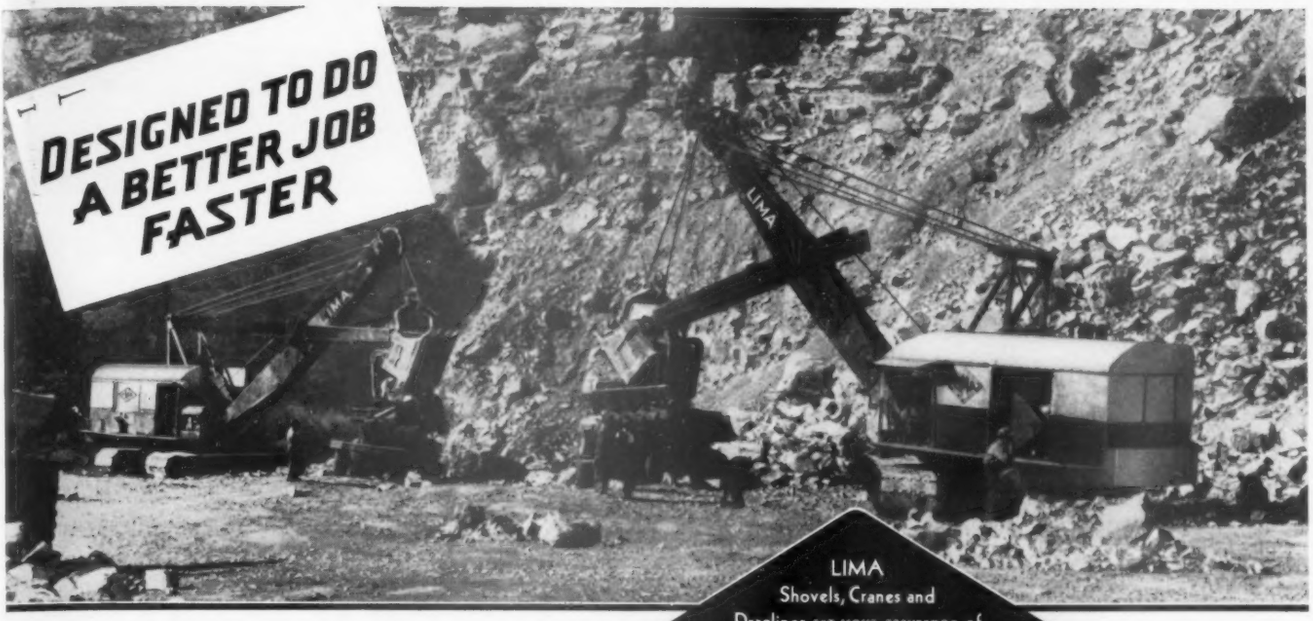
★ ***10% to 14% MANGANESE STEEL***
Chains and all fittings.

Write for descriptive literature, or see your equipment distributor.



HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. · MANSFIELD, LOUISIANA

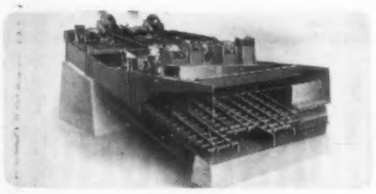


LIMA
Shovels, Cranes and
Draglines are your assurance of
greater output and fewer delays on the big
jobs that you are planning for the future — and that is
not all, the maintenance and lubrication cost of LIMA Shovels,
Cranes and Draglines is surprisingly low too, due to their many practical
features. If you plan to buy a new shovel, crane or dragline,
for peace time work, LIMA will give you greater
speed, bigger output and more efficient
operation. Write or wire to-
day for descriptive
bulletins.

LIMA LOCOMOTIVE WORKS,
INCORPORATED
Shovel and Crane Division
LIMA - - - - - OHIO

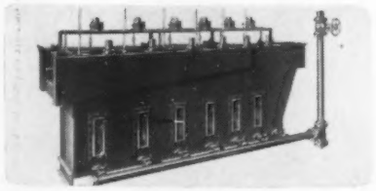
"A TYPE AND SIZE FOR EVERY JOB"

SHOVELS
DRAGLINES
CRANES



The Dorr Classifier

Dorr Hydroseparators



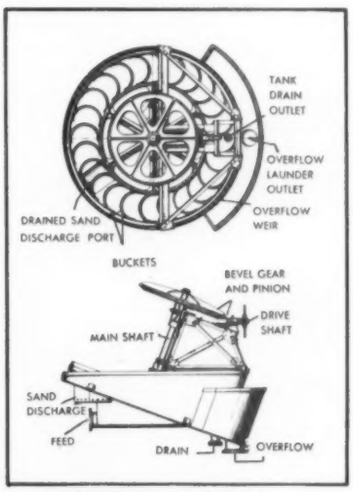
The Dorrco Sizer

PLAN NOW FOR THE POST-WAR "SAND STORM"

Here is a concrete fact about concrete sand. According to the recently announced post-war national road building program, an estimated 150 million cubic yards of sand will be demanded. Sand specified to contain up to 15% minus 100 mesh.

Road construction is only one of the many fields which will demand sand of exacting specifications in the post-war and reconversion periods; mass concrete, foundry cores, glass, etc., will also tax heavily your sand producing facilities.

Now is the time to start planning for these varied and specialized large quantity demands for sand. Call in one of our engineers and he will make a scientific engineering survey of your present facilities and future developments.



The Dorrco Sand Washer

DORR
RESEARCH — ENGINEERING — EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

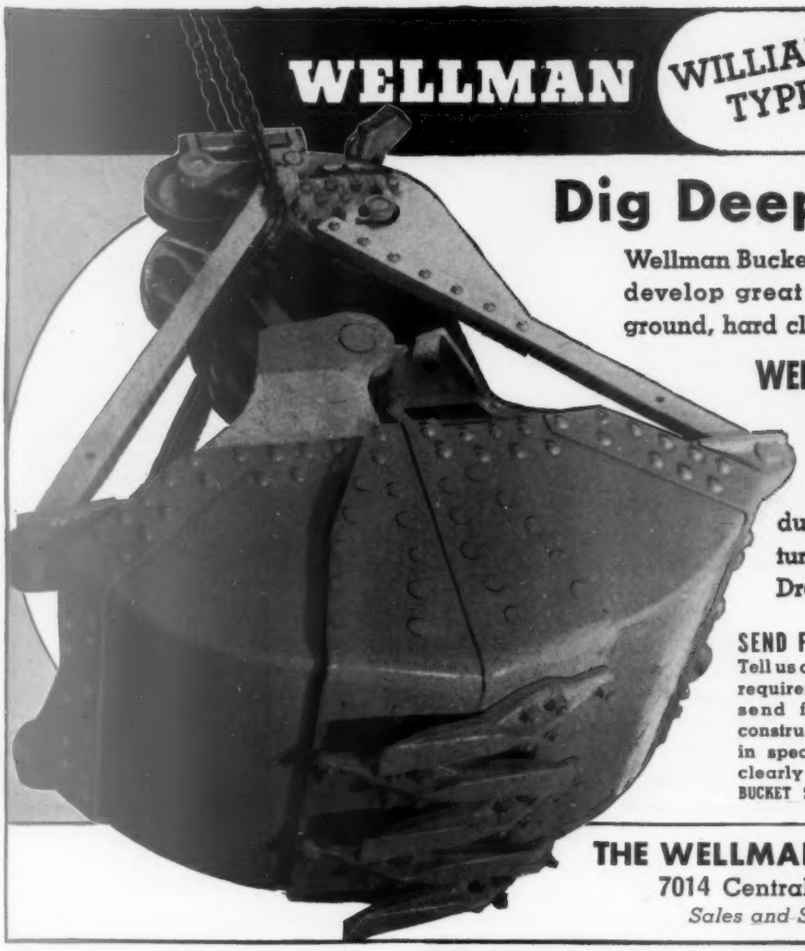
DORRCO

THE DORR COMPANY, ENGINEERS

NEW YORK 22, N. Y. 570 Lexington Ave. — CHICAGO 1, ILL. . . . 221 No. LaSalle St.
ATLANTA 3, GA. . . William-Oliver Bldg. — DENVER 2, COLO. . . . . Cooper Building
TORONTO 1, ONT. . 80 Richmond St. W. — LOS ANGELES 14, CAL. . 811 West 7th St.
RESEARCH AND TESTING LABORATORIES . . . . . WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION . . . . . 570 LEXINGTON AVE., NEW YORK 22

6538

WELLMAN (WILLIAMS TYPE) BUCKETS



Dig Deep and Bite Clean

Wellman Buckets, in Power Arm and Multiple Rope Types develop great digging power. They bite into frozen ground, hard clay or shale, and come up with full loads.

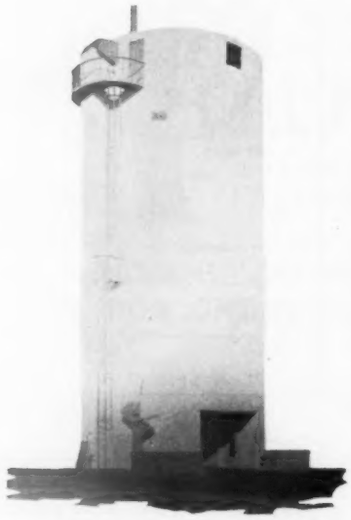
WELDED ROLLED STEEL CONSTRUCTION
FOR GREATER STRENGTH AND LONGER LIFE

Welded design which made Wellman Buckets so universally preferred for heavy duty in steel plants and dredging, is now featured in all Wellman-Williams Clamshell and Dragline Buckets — 3/8 to 16½ yd. capacities.

SEND FOR FREE BULLETIN
Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly proves why YOUR NEXT BUCKET SHOULD BE A WELLMAN.

THE WELLMAN ENGINEERING COMPANY
7014 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in principal cities

One Responsibility, Design and Construction



WE BUILD THEM — durable concrete bins for storing all kinds of bulk materials.

WE EQUIP THEM — handling machinery is supplied "tailor-made" to suit the specifications of each job.

WE GUARANTEE THEM — taking full responsibility for the design, construction and efficient operation of every installation.

Consult experienced NEILL engineers for assistance in meeting current storage problems, or in preparing for post-war needs.

W. B. NEILL, INC.

30 VESEY STREET
NEW YORK 7, N.Y.

neill
ENGINEERS
CONTRACTORS

NOVEMBER, 1944

The CONCRETE MANUFACTURER

A Special Section of ...

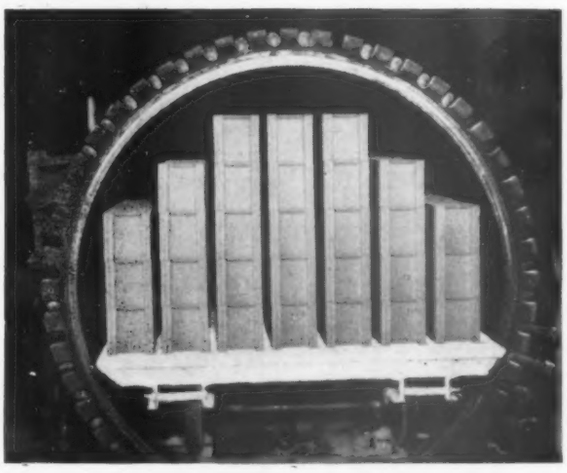
from DAYS to HOURS

J&C STEAM KILNS

WITH HIGH PRESSURE

YOU

Can Accomplish a reduction in the CURING Period for Concrete Products



Looking into one of the kilns loaded with blocks on racks.

J&C steam kilns permit 24-hour deliveries from molding machine to construction jobs, with strengths equal to or greater than moist-cured concrete products 28 days old! And above all the delivery of concrete that is fully aged and practically free from future expansion and contraction —a basic cause of objectionable wall cracking.

Reduce stock-pile investment. Conserve space. Save extra handling. Speed deliveries. Insure dry delivery of shrink-proof concrete products. Obtain high early strengths with less cement.

Jackson & Church high-pressure curing installations are to be found from coast to coast. You, too, can profit by this important technical aid to better concrete products. For further information and prices write:

JACKSON & CHURCH CO.
SAGINAW, MICHIGAN, U.S.A.

The CONCRETE MANUFACTURER

NOVEMBER, 1944

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

Published by Pit and Quarry Publications
538 South Clark St. Chicago 5

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

W. E. TRAUFFER
Editor

HARRY F. UTLEY
Senior Field Engineering Editor

WILLIAM M. AVERY
Field Engineering Editor

SPENCER JONES
Eastern Field Engineering Editor

BARRY JAMES
Associate Editor

W. T. KLUSSMAN
Secretary

RAY L. SMITH, JR.
Circulation Manager

General Manager, Field Contracts:
JAMES E. MONTGOMERY
538 South Clark Street
Chicago 5, Ill.

Eastern Manager, Field Contracts:
W. A. WILSON
Room 1235, 101 Park Ave.
New York 17, N. Y.

Central Manager, Field Contracts:
D. R. EGBERT
859 Leader Bldg.
Cleveland 14, O.

Western Manager, Field Contracts:
E. C. KAYE
Chicago 5, Ill.

Field Manager, Pit and Quarry Handbook:
P. K. JOHNSON
Chicago 5, Ill.

Pacific Coast Manager, Field Contracts:
WALKER & MINTON
403 West 8th Street
Los Angeles 14, Cal.
68 Post Street
San Francisco 4, Cal.

New Unit Will Double Graystone Block Output

Installation of a new automatic concrete block machine to meet steadily mounting demands for its product, was recently announced by F. M. Kettenring, president of the Graystone Concrete Products Company, 134 Nickerson Street, Seattle. This new unit will double the present capacity of this plant. Mr. Kettenring attributes the increased use of concrete blocks to the saving in construction-time when concrete blocks are used for walls; for, due to speed of laying, absence of the use of forms, they can be laid one day and be ready for the carpenter the next.

Postwar Tasks Studied at Cement Ass'n Meeting

Regional meetings of the Portland Cement Association committees on Technical Problems and Manufacturing Research were held September 16, 17 and 18, in the Hotel Bethlehem, Bethlehem, Pennsylvania. Myron A. Swayze, of the Lone Star Cement Company, Hudson, New York, was chairman of the Technical committee; and Henry P. Reid, assistant to the president of the Universal Atlas Corporation, New York, headed the Manufacturers group. In each case the tasks confronting the industry after the war were discussed. F. B. McMillan, director of the Portland Cement Association of Chicago, reported on the technical work done by that organization for the benefit of its membership.

Aircraft Plant Will Produce Concrete Items

A post-war development of an unnamed San Diego, California, aircraft-manufacturing plant will include the manufacture of some unusual concrete products on a large scale.

The first plant to turn out these units will shortly be located at Vista, California, where it is planned to produce precast door and window frames. Later on shower-bath stalls, retaining-wall panels and large, sectional concrete panels for a wide type of building construction will be manufactured.

The Vista plant will, in a sense, be a pilot or experimental plant. As production is developed it is expected that branch plants will be established in other Pacific Coast cities. Vibrating equipment will be employed to compact the concrete and high-pressure steam curing will be standard practice.

Waterloo Firm Adds New Equipment for Expansion

The Waterloo Concrete Company recently purchased the assets of the Ribstone Silo Company, Anamosa, Iowa. The new owners, C. L. Douthett and Floyd Goodrich will enlarge and expand the business. Plans call for adding a modern concrete building block machine, and possibly one for the manufacture of drain tile. The main office and plant operations will be continued as usual in Waterloo.

Atlas Lumnite Cement Co. Appoints Sales Mgr.

Roy T. Giles recently was appointed sales manager of The Atlas Lumnite Cement Company, New York. He has spent much of his time in the development of refractory concrete, which is used for lining furnaces, and in other construction exposed to high temperatures. This use now constitutes a large volume of the present consumption of Lumnite. Mr. Giles also has written several articles on the subject; one paper was presented at the annual meeting of the American Ceramic Society.

A change in the ownership of the Oldheiser Concrete Products Company, Dickinson, North Dakota, was recently announced by Rudolph Oldheiser, who has run the company for the past six years. Taft Sandowsky, former Dickinson resident, is the new owner and will operate it as the Dickinson Concrete Products Company.

R. T. Majors, Sebree, Kentucky, recently purchased concrete block machinery and plans to start manufacturing blocks in the near future.

General view of Eggers batching plant.

Lumber Firm Operates Unique Transit-Mix Batching Plant

another ON THE SPOT report

THE Charles F. Eggers Company of Uniontown, Pennsylvania, an enterprising lumber concern founded over half a century ago, has been supplying its customers with transit mixed concrete for the past ten years. To be precise, it was in 1935 that Alson C. Eggers, whose father founded the business, made his first purchase of a Blaw-Knox one-cubic yard mixer mounted on a Ford truck. Local builders and contractors welcomed the new service offered, and within the first year it became necessary to purchase 2 additional Blaw-Knox one-cubic yard mixers. Since that time 2 Jaeger 1½-cubic yard mixers have been added to the fleet, one (a Ford truck) in 1941 and the other (an International truck) purchased during the present year.

Three years ago it became apparent that modern batching equipment

By WILLIAM M. AVERY

of some type was needed if the plant's capacity was to be kept abreast of the demands being made upon it, and Mr. Eggers conceived the idea of developing an economical batching system using conventional bins and portable conveyors. A two-compartment 15-ton Blaw-Knox batching bin equipped with a Howe scale was purchased and set up on concrete piers at a convenient location beside the roadway through the plant yard. Farquhar portable belt conveyors were set up at each end and on one side of the bin. The two longer conveyors at either end of the bins are used for loading in coarse and fine aggregates, while the short conveyor at the side conveys the weighed batch from under the bins out over the roadway, and discharges into the truck mixers.

Sand and gravel are brought into the plant in hired trucks, which dump directly onto the portable conveyors insofar as possible. In this manner a considerable portion of an average 10-ton truck load of aggregates can be elevated to the bins without shoveling, and even when some shoveling is required, 2 men operate the plant without any difficulty. Cement, which is shipped in by rail on the company's own siding, is dumped directly into the mixer from a raised platform opposite the bins. The water tank is also filled from across the roadway, although no water is introduced into the mixer until about 15 minutes before actual delivery.

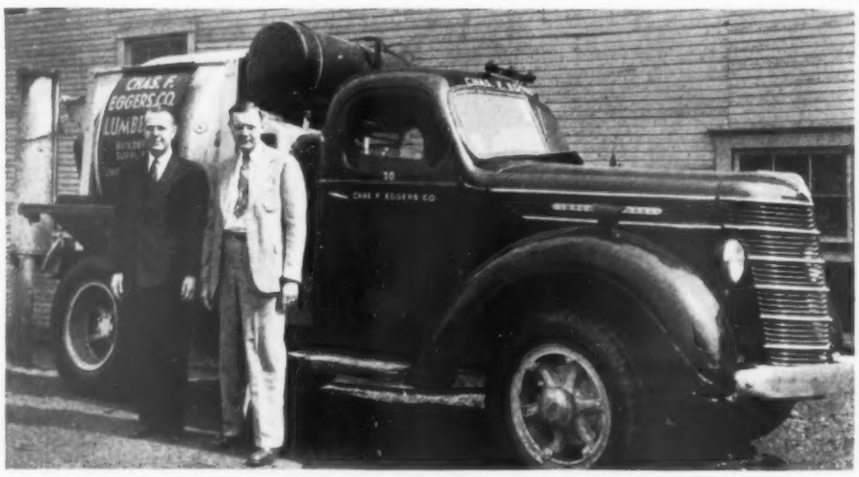
The plant has a capacity of 100 cubic yards per eight-hour day, and recently on a monolithic pour for a mine air shaft this rate of output was sustained for 24 hours, despite a haul of about 7 miles.

Mixes are prepared in accordance

Portable conveyors at measuring bins, with truck under discharge conveyor.

with the purchaser's specification if he so desires. Vinsol-resin cements have been used to a considerable extent, and during the winter months it has been the practice to use both high-early strength cement and calcium chloride in the mixes. The company's office building and warehouses are steam heated, and economical heating of the aggregate has been achieved by piping the pop-off discharge from the steam plant to the Blaw-Knox bin. On days of long runs of the mixing plant in extremely cold weather it is simply necessary to increase the fre-

(*Continued on page* 137)



Alson C. Eggers, right, and his son, Charles F. Eggers II.

Harry Hayley and Four Sons Operate Leading Canadian Products Plant

By W. E. TRAUFFER

another ON THE SPOT report

HARRY HAYLEY of Ottawa, Ontario, has the double distinction of being one of the largest manufacturers of concrete products in Canada and also one of the pioneers in this industry. He first began to make concrete blocks on a small scale in 1904 and in 1914 added cast stone. In 1918 he began to concentrate on cinder blocks and is said to have been one of the first on this continent to make them. In 1920 concrete pipe and in 1922 laundry tubs were added to the list of products made. Catch basins, floor and roof slabs, manholes, valve chambers, etc., have since been added. Concrete bricks have always been made as fillers for blocks but no attempt has been made to compete with clay face brick.

The expanding business soon outgrew the original yard and in 1926 Mr. Hayley moved his operations to the present 5-acre site on Hurdman's Road, a few miles from downtown Ottawa. The extent of the present operations may be visualized from the fact that in one year the total output included 1,000,000 concrete blocks, 48 miles of concrete pipe, 1,200 laundry tubs, 1,200 catch basins, 12,000 cubic feet of cast stone, etc. As many as 90 men have been employed at one time. The best years were 1929 to 1932 inclusive, when the relief work being done by municipalities created a large demand for some of the company's products. In 1943 the demand again reached this high level due mainly to the construction of war plants, camps, air bases, etc. In 1944 this type of demand fell off considerably, although hospitals for returning wounded and similar structures are still being built. The volume of private residential and business construction has increased as the government demand fell off.

Harry Hayley at left with his sons Bert, Bill and Phil.

Unlike the United States, Canada has imposed no restrictions on private construction except to give governmental and vital war projects, now chiefly hospitals, top priorities. Anyone can build a house or business building if he can find the necessary materials and labor. The only restriction on this kind of work was a maximum ground-floor area of 700 square feet and this has been withdrawn. All that keeps producers from enjoying another big year is the shortage of labor.

Mr. Hayley's staff now consists of only 30 men, including truck drivers, clerks, etc. Where 30 delivery trucks were once operated only 12 are now in use. Three of these are recent model Mack tandem-wheel units with 17-foot bodies which carry an 11-ton payload. Deliveries were at one time made chiefly by truck up to 175 miles from the plant. Now truck deliveries are restricted to a 350-mile maximum and any more distant shipments are made by railway. Under these conditions the plant is 250,000 blocks behind on orders and it has been impossible to build up any storage piles in the yard.

Mr. Hayley is still active in all departments of his business but is ably assisted by his four sons. Bert is superintendent of plant equipment; Bill is in charge of cast stone, drafting, etc.; Phil is sales manager. Cecil was office manager but is now a lieutenant in the Canadian armored forces.

Part of Haley block plant and yard showing small amount of products in storage.

Gasoline lift truck stacking finished laundry tubs.

The machine which makes small concrete pipe. Note elevation of turntable above floor for easy cleaning.

Tractor with bulldozer feeding cinders from 100,000-cubic yard stock pile to plant.

Stone planer used for planing and forming cast stone.

Special toothed saw used for cutting cast stone, mostly reinforced.

Lifting finished manhole section from mold by chain hoist.

Although most of the blocks and bricks now produced are made of cinder aggregates the company uses sand and gravel for most of its other products. This material is secured from a company-owned pit 14 miles from the plant and is so well graded that screening is not necessary. The company also has a quarry 65 miles from the plant where the crushed limestone aggregate for white cast stone products is made. Other crushed stone is purchased.

The cinders are from soft coal burned under forced draft and contain no combustible matter. Most of them come from paper mills. A sizable stock pile has always been maintained and this was built up to 100,000 cubic yards before the war restrictions on transportation, etc., went into effect. An Allis-Chalmers tractor with a Buckeye bulldozer feeds the cinders from storage to a grizzly ahead of a Watson jaw crusher. The grizzly throughs and crusher fines go to a roll-crusher from which the cinders go to storage bins over the block and brick machines.

The concrete-block department has been kept up-to-date by the installation of improved types of machines as these became available. Up to the latter part of 1943 six tamper-type machines were used. These were replaced by a Besser Super Vibrapac machine which, according to Mr. Hayley, not only makes more blocks but also makes them cheaper and with less labor. It is equipped with a pneumatic off-bearer and other standard equipment and makes all standard sizes and types of sand-and-gravel and cinder blocks. One of the tampers was retained to make face blocks and specials.

Two Dunn 10-cubic-foot bowl-type mixers now mix the concrete for the Besser machine but they will be replaced by a 30-cubic foot mixer of similar design. The aggregates are now measured volumetrically and the cement is dumped into the mixers from sacks. As soon as the equipment can be obtained, aggregate and bulk-cement silos, and weigh-batchers will be installed. A special bulk-cement truck body has already been built.

The cinder blocks have always found favor in this climate because of their high insulating value. In the winter temperatures often drop to 50 degrees F. below zero. In recent years there has been considerable farm demand for silos, barns, etc. There has also been considerable demand for cinder silo blocks as silage does not freeze in them as easily as it does in other types of construction.

A Dunbrik machine is used to make concrete bricks. This was installed in 1938 and replaced another type of machine. A 10-cubic foot Dunn mixer supplies the concrete.

The concrete pipes from 4 to 30 inches in diameter are made on a Watson McCracken 2-mold-type pipe machine which is made in Canada under the McCracken patents. This machine was installed with its turntable 6 inches above the floor level for easier cleaning. It makes 4- to 30-inch bell-and-spigot pipe. Quinn steel molds are used for making lock-joint-type reinforced pipe up to 84 inches in diameter. The concrete for the pipe machine is supplied by another 10-cubic foot Dunn mixer and that for the larger pipes by a small job mixer. The blocks and pipes are cured for 8 hours in steam rooms for which the steam is supplied by a 40-horsepower boiler.

Cecil Hayley, former office manager, is now a Canadian army lieutenant.

Before the war much ornamental cast stone was made to architects' designs but this type of demand is now nearly non-existent. The demand now is for comparatively plain cast-stone units and it seems evident that this type will predominate after the war. Ornamental stone from this plant has been used in many important buildings. One of the most interesting and impressive installations is a 1½-mile ornamental fence

(*Continued on page* 136)

Part of the 1½-mile cast-stone fence which surrounds the residence of the Governor General of Canada in Ottawa.

Firm Turns to Ready-Mixed Concrete to Carry On

By WILLIAM M. AVERY

another ON THE SPOT report

THE Washington Concrete Company of Washington, Iowa, was organized in 1931 to manufacture concrete pipe, but happily the owners some time ago incorporated equipment and facilities for producing ready-mixed concrete. The word "happily" is used advisedly, for in March of this year the manufacture of pipe ceased altogether due to the shortage of labor and the lack of high priorities for reinforcing steel, and at the present time the ready-mixed-concrete users alone keep the plant operating.

The plant's 4 Concrete Transport mixers (three 1½ - cubic - yard and one 2-cubic-yard) are now kept busy supplying concrete for feeding platforms, barn floors, cribs, tanks and other farm structures, and on a 4-mile haul they regularly deliver from 60 to 70 cubic yards per day.

The Northern Gravel Company of Muscatine, Iowa, supplies all the ¾-inch gravel and the sand used in the operations, the material being delivered to the plant siding in open-top cars. A Northwest 105 clamshell shovel with a ⅝-cubic-yard bucket is used for unloading the aggregates on open stock piles in the yard, and also for filling the 2-compartment 30-ton Heltzel trailer bin. The batching bin has a scale beam on each bucket and a graduated water tank from which the truck-mixers are supplied.

General view of the plant for manufacture of concrete pipe.

When the trucks have finished loading under the batching bin they are spotted under an overhanging platform which is an extension of the second floor cement - storage room in the main plant building. The cement is dumped into the trucks from this platform by means of a wheeled buggy. From the opposite end of the storage room, which opens on the railroad siding, the sacked cement is brought in from box cars by means of a hand truck.

When the plant is manufacturing concrete pipe the batching is done with the same Heltzel bin used in ready - mixed operations, and the batch flows directly by gravity into a 10-cubic-foot Wonder mixer set up beside the bin.

At the time of the construction of this plant the company was called the Wilson Concrete Company. The present name was adopted in 1937, although plants operating under the same ownership at Red Oak and Des Moines, Iowa, still carry the name Wilson Concrete Company. The plant at Red Oak, which was built in 1905, produces concrete pipe, block and ready-mixed concrete, and is said to be the oldest pipe plant west of the Mississippi River. The Des Moines plant produces only concrete pipe.

As soon as the easing of priority restrictions and the labor supply make it possible the Washington plant will resume manufacturing pipe, and it is probable that concrete blocks will also be produced. A Stearns stripper block machine was installed in 1939, but this machine has since been sold for use on a defense housing contract at Fairbanks, Alaska.

Robert Arthur is manager of the Washington plant.

Surplus army truck loading a 36-inch diameter concrete pipe.

Left: Batching a 1½-cubic yard concrete transport open-top mixer.

Below: Dumping cement into a mixer from an overhead platform.

Hayley (*from page* 134)
around Government House, the residence of the Governor General of Canada. The plain units are made in sand molds on vibrating tables and are cured in the molds. Another Dunn 10-cubic foot mixer is used in this department.

Cross section of catch basin showing construction of external trap.

After curing, these units, most of which are steel reinforced, are cut by a Carborundum-toothed saw. Planing and forming are done by a planer of the type used for dimension stone. Floor and roof slabs are also made on vibrating tables. One of the largest jobs supplied was the Lord Elgin Hotel in Ottawa which used 140,000 square feet of floor and roof slabs and 160,000 cinder blocks.

In 1932 Mr. Hayley patented a catch basin which is made in sections and has an external trap which cannot freeze or break off. This trap can be cleaned out through a swinging gate. The top of the catch-basin can be swivelled to fit the angle of the street. This catch-basin is used by Ottawa and other cities and towns for government airports, etc. The United States rights for this product are held by the Hayley Products Corporation, Cleveland.

The Rideau concrete laundry tubs have been an increasingly popular unit, especially since the war began. A standard tub, complete with copper binding, legs, etc., weighs 425 pounds. They are sold through plumbing-supply dealers and are installed in most of the new houses being built.

Lift truck taking a rack load of cinder blocks from machine.

Sectional manholes are also made but concrete manhole covers have never become popular as there has been no shortage of cast-iron covers in Canada.

The handling of the various products is done mechanically wherever possible. The block and brick racks are carried to and from the curing rooms by a Clark gasoline lift truck. A Mighty Midget Motolift truck is used in the cast-and architectural-stone departments and this also handles the laundry tubs, catch-basins, etc. The machine-made pipes and their molds are handled by hand-lift trucks but the larger cast pipes are handled by a Caterpillar tractor. In the cast-stone department the forms are handled on the floor by overhead chain hoists.

Practically all the necessary repair work in this plant is done in its own machine and repair shop and in other ways the company is as nearly self-sufficient as possible. Among those employed are welders, machinists, mechanics, maintenance men, etc.

Renegotiation Exemption Ruled for Concrete Ass'n

The National Ready Mixed Concrete Association has just been advised of the favorable action by the War Contracts Adjustment Board on the Association's application for exemption of ready mixed concrete from renegotiation. The following letter of approval was addressed to V. P. Ahearn, executive secretary of NRHCA.

"The War Contracts Price Adjustment Board has considered your application dated May 27, 1944 for the exemption from renegotiation of ready mixed concrete as a standard commercial article under the provisions of subsection (i) (4) (D) of the 1943 Renegotiation Act. After investigation, the Board has determined that competitive conditions affecting the sale of ready mixed concrete are such as will reasonably protect the Government against excessive prices, and, accordingly, the Board has adopted a regulation exempting ready mixed concrete from renegotiation, and adding this product to the list of products previously exempted by the Board as set forth in paragraph 845 of the Renegotiation Regulations.

This regulation, as it relates to the exemption of ready mixed concrete, reads as follows:

Pursuant to the authority given to the War Contracts Price Adjustment Board by subsection (i) (4) of the Renegotiation Act of 1943, the Board, under the provisions of subsection (i) (4) (D) of the 1943 Act, has exempted from renegotiation amounts received or accrued during fiscal years ending after June 30, 1943 and prior to July 1, 1944 under contracts or subcontracts for the making or furnishing of ready mixed concrete.

JOHN M. COATES, legal counsel for the Masonite Corporation, Chicago, was recently appointed a director of the company.

ERIE TRUCK MIXER PLANTS

Erie builds a complete line of central concrete plants to keep truck mixers on the move.

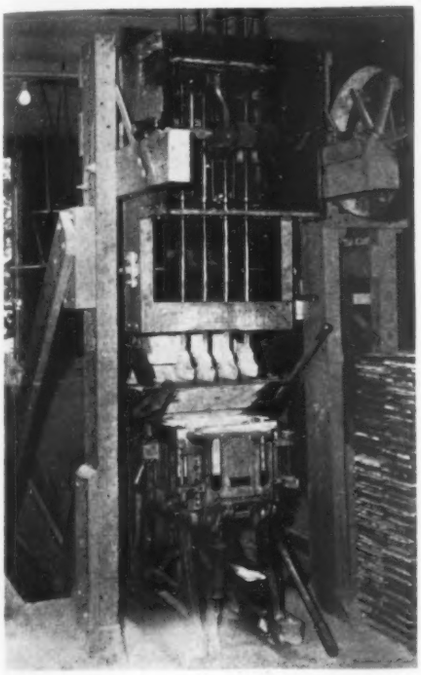
Consult Erie now for the most modern of Post-war Plants.

ERIE STEEL CONSTRUCTION CO · ERIE, PA.
Aggre Meters · Buckets · Concrete Plants · Traveling Cranes

Lumber Firm (*from page* 131)

quency of pop-offs by firing the furnaces somewhat harder than would ordinarily be required.

Charles F. Eggers II, who is assistant treasurer of the firm, has recently added concrete blocks to the company's line of building materials by the installation of an Anchor automatic tamper in one of the plant



Automatic tamper in block plant, with mixer in background.

View of portable conveyor, showing cleats.

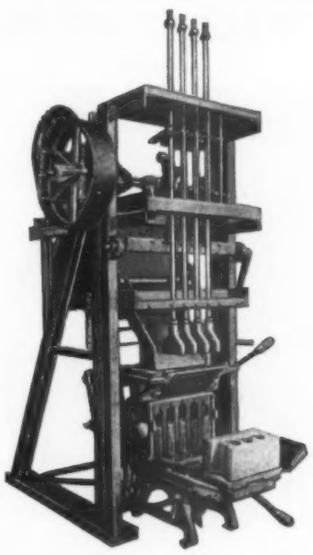
buildings. On this machine one man and a helper are producing about 300 blocks per day for retail sale only. If this venture conforms to the family pattern, PIT AND QUARRY readers may look forward to yet another story on unique plant developments at the Charles F. Eggers Company of Uniontown, Pennsylvania.

—Your Country

—Is Still at War
—Are You?

The Superior Concrete Products Company of Seattle is erecting a new 1½-story frame structure to house its business.

The building, to cost $9,000, will be 48- by 106-feet in ground area and is being constructed by the company's own forces.

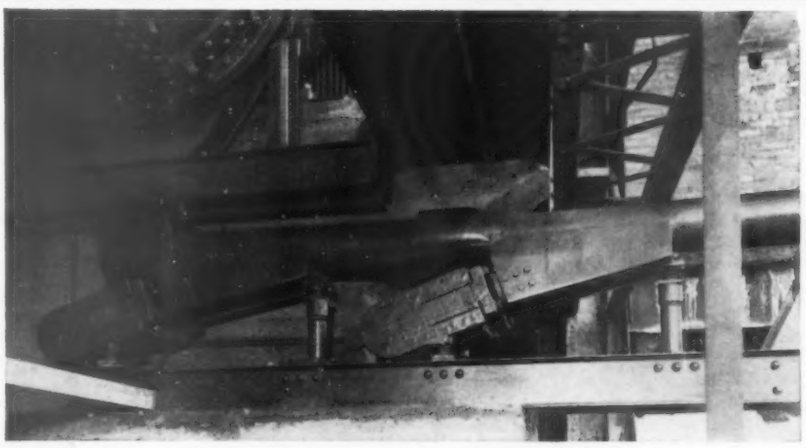


Recognized Everywhere

The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Jolt-crete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
1191 Fairview Ave. Columbus, Ohio



SYNTRON
REG. TRADE MARK
"Vibra-Flow"

VIBRATORY FEEDERS

Provide "Finger-Tip" Rheostat Control of Material Flow—or Electric Eye or Electric Ear Control—or automatic control by pyrometer, flow meter, pH indicator, etc.

From OUNCES to hundreds of TONS per hour.

NO MOTORS — GEARS — NOR OTHER MECHANICAL WEARING PARTS

Write us today about your problem

SYNTRON CO., 385 Carson, Homer City, Pa.

PALLET OILER AND CLEANER

Not only keeps pallets clean and oiled, but also when placed adjacent to block machine serves as a handy feeding station.

Write for Circular

THE KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

F. W. Dodge Corp. Sees Home Building Surge After War

The construction industry will have the capacity to produce about 350,000 homes during the first twelve months after the defeat of Germany, according to the best estimates and opinion of government officials and industrialists. Independent inquiries and investigations by the F. W. Dodge Corporation bear out the accuracy of these expectations on the basis of all available information.

Builders the country over are not so much concerned with the market for new homes as they are with their capacity to produce in the light of expected stringencies in equipment and materials, at least during the first three months after V-E day. Many have been engaged in supplying housing needs in critical areas as a part of the war effort, and hence are ready organization-wise to proceed with orders on hand, and to build houses for sale or rent.

There are many factors which have an important bearing on the capacity of the industry to produce new homes. Among these are the availability of labor, building materials and equipment, and the attitude of such government agencies as the War Production Board, the National Housing Agency, and the War Manpower Commission toward a home-building program.

As far as is known all government agencies recognize that the success of reconversion depends in great measure on the construction industry. They have considered a schedule of production of scarce items presenting the toughest conversion or supply problems. The idea is to get a balance of building equipment on the market three months after V-E Day to make possible orderly building procedure.

The latest estimates from reliable sources point to the availability of 1,120,000 construction mechanics, and in addition 440,000 helpers and experienced laborers, many of whom are now engaged in war industries. This would provide more than sufficient man power and skills for an over-all building program of $5,000,000,000 to $6,000,000,000, which students of construction trends are estimating for the first twelve months after the end of European hostilities.

The limitations on the supply of building materials in general will be temporary, and these will be caused mainly by reconversion and inventory problems. It now appears that when these temporary problems are solved, the supply of all materials except lumber and some types of plumbing fixtures will be sufficient for a program of at least 850,000 dwelling units a year, including single-family residences as well as multiple units in apartments, hotels and dormitories, after the first year of peace.

A recent government bulletin pointed out that the long-range outlook for lumber is good, but the supply will be restricted for a time. Despite great difficulties, caused by shortages of logging equipment and skilled woods labor, Class 1 consumers, such as the Army, Navy, Maritime Commission and builders of war housing, are getting the lumber they need. Once the needs of Class 1 consumers drop, the demands for a $6,000,000,000 building program can be met, and such a program envisions the construction of 350,000 dwelling units.

J. J. Fox, formerly with the Lone Star Cement Corporation and for the past 12 years chief chemist of the Missouri Portland Cement Company, St. Louis and Kansas City, Missouri, has joined the Glen Falls Portland Cement Company at Glen Falls, New York, as general chemist.

Scrapers and Cableways for Long Haul Work

Above picture shows how a Sauerman Slackline Cableway digs deep under water and lifts gravel to a hopper on top of a screening plant. The operating cost is only a few cents per cubic yard handled and the machine cleans up every yard of material within a 700-ft. radius of the plant. This machine was installed in 1919—has handled several million cubic yards at three locations—is still as good as new.

Digging and stockpiling problems that confront aggregate producers are simplified—costs are reduced—by use of Sauerman Scrapers and Cableways.

A Sauerman machine digs with equal facility under water, on mushy ground, on a hillside or in a rough pit. Operation is continuous — digging, hauling and dumping. Capacities run from 10 to 600 cu. yd. per hour, varying in accordance with size of bucket and length of haul.

Tell us about your excavating and material-handling problems. If we think Sauerman equipment will meet your particular needs, we will offer suggestions and send you our catalog.

SAUERMAN BROS., INC.
534 S. Clinton St., Chicago 7

Pit and Quarry Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

To keep its readers fully informed, PIT AND QUARRY taps every source. Our field editors travel more than 20,000 miles a year to describe the processes and methods used by the outstanding plants making your type of product. Government activities affecting the field are interpreted so that you can better adjust your business to their regulations. Complete reports of all important conventions are published in PIT AND QUARRY. The new equipment and supplies which may make production more efficient are announced in each issue.

Reading PIT AND QUARRY is like having a conference every month with the leading men in your industry. You don't have to stir out of your chair to get information that otherwise would take you years to obtain by your own efforts and experience.

The cost of this service in only $2 a year. Start your subscription at once by just filling and mailing the coupon below.

Return This Coupon Today—Start Your Subscription with the November issue

---

PIT AND QUARRY PUBLICATIONS,
538 So. Clark Street, Chicago 5, Illinois.

Enclosed find remittance for which enter my subscription to Pit and Quarry for ☐ 1 year $2.00 starting with the November issue. (Foreign add $1.00 per year.)

My Name ..... **Title**.....

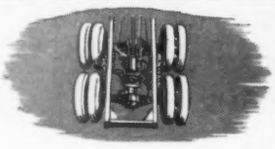
Company Name .....

Send to (Address) .....

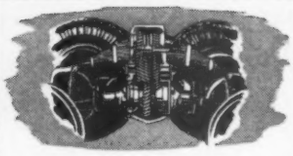
We Produce .....

6 REASONS

WHY YOU SHOULD IMMEDIATELY CONVERT YOUR 1½-2 TON MEDIUM TRUCK INTO A HEAVY DUTY TRUCK WITH THE THORNTON FOUR REAR WHEEL DRIVE



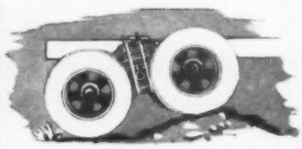
2 DRIVING AXLES *under* the load gives 100% more traction and 100% more payload capacity



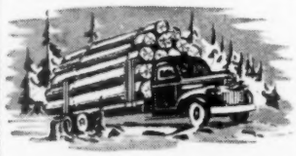
2 SPEED GEAR CASE, mounted between driving axles, doubles motor torque and rim pull.

CLIMBS STEEPER GRADES as result of doubling torque and rim pull.

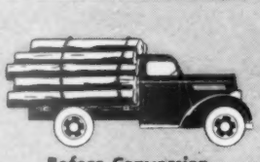
SPEED **FOR THE HIGHWAY** results from high-speed gear ratio in gear case.



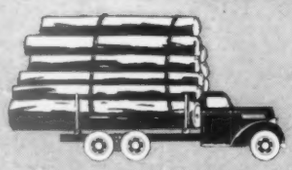
"WALKING" BEAM TYPE SPRINGS maintain maximum traction and decrease shock loads by 50%.



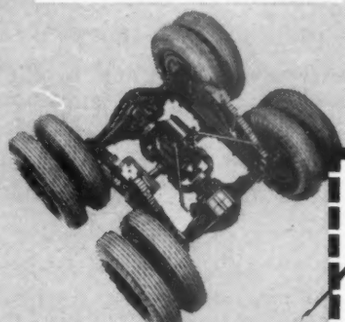
THORNTON 2-SPEED BOGIE insures successful off-highway operation.



Before Conversion



After Conversion
CUTS HAULING COSTS



This is the Thornton Drive, consisting of 2 driving axles, 2-speed gear case assembly, "Walking Beam" type springs; wheels; tires.

Thornton Tandem Co., 8741-F Grinnell Avenue
Detroit 13, Michigan, U.S.A.
Please send me free catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name _____
Address _____
City _____ State _____
Make of Truck _____ Year _____
Used for _____

THORNTON TANDEM COMPANY • 8741-F GRINNELL AVE., DETROIT 13, MICH.

CONSERCO SYSTEM

delivers concrete anywhere, anytime, on any scale.

CROSS-COUNTRY CONCRETE TRUCK RENTAL SERVICE

Featuring:

4, 4½ or 5 yd. truck and mixer . . . truck and mixer maintenance . . . experienced driver . . . truck delivered to job . . . gasoline . . . insurance . . . oil.

Write for full details, including rates.

CONSERCO, INC., Washington, D. C.

Are you ready?

Building programs are beginning to move fast. Are you ready?

N & F bins, with proper conveyors to store and load sand and gravel, will cut labor costs, cut trucking needs, save time and money at every turn. Stave construction—can be moved for re-erection. Any capacity. Guaranteed. Get catalog now.

THE NEFF & FRY COMPANY

CAMDEN, OHIO

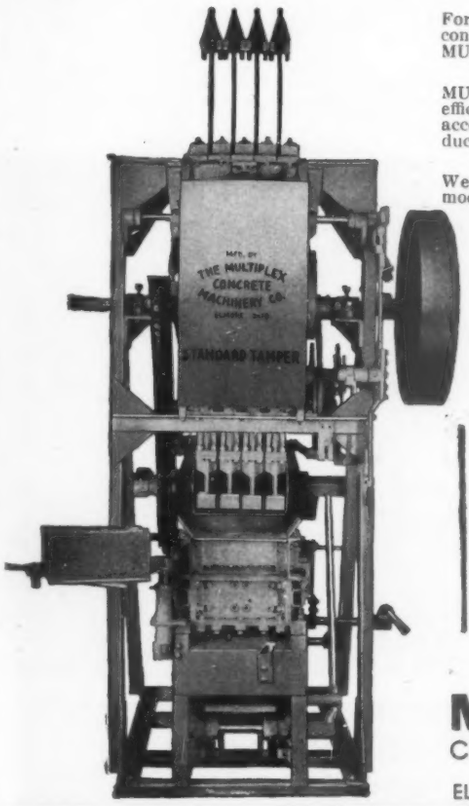
JAEGER "FLEET FOOT" CRANE-LOADER

Can travel 12 m.p.h., turn in 10½ ft., climb any ramp—hoists faster than 1 ft. per second and swings 12-18 ft. boom 90° to either side without outriggers for loading and accurately placing up to 10,000 lbs. Nimble-powerful, safe (no load ever over operator). Tier loader attachment if desired. Send for Specification CL-44.

THE JAEGER MACHINE CO. 602 DUBLIN AVENUE COLUMBUS 16, OHIO

Hoists, Winches, Air Compressors, Truck Mixers, Mixers, Centrifugal Pumps

MULTIPLEX Machines For Postwar Profits



For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

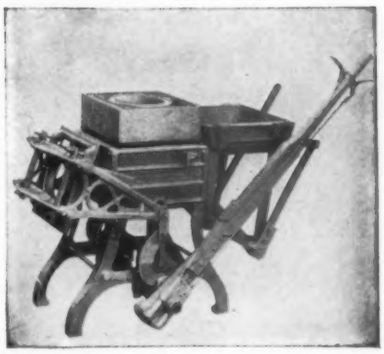
MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

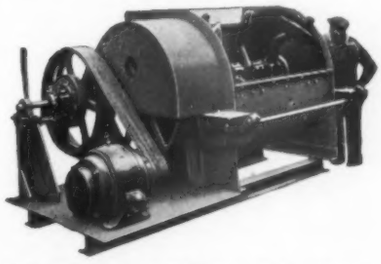
Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.

MULTIPLEX
CONCRETE MACHINERY CO.
Frank Muenzer, President
ELMORE • OHIO



The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.



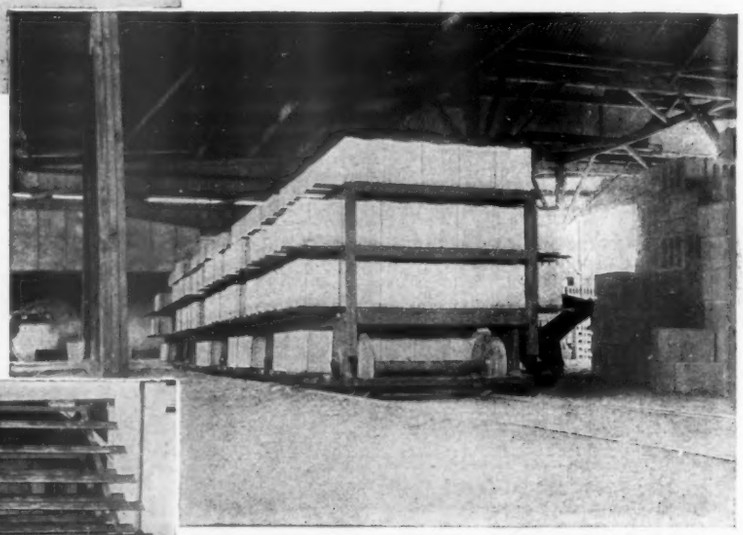
MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

CHASE

. . . for 35 years the leading maker of lift-truck racks and cars for the concrete products industry

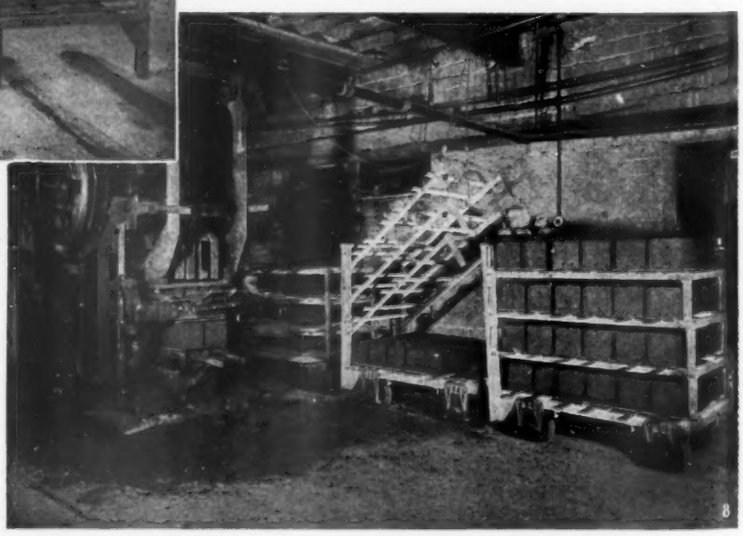
ABOVE — Chase Style 2167 Lift-Truck Racks with steel decks in the block plant of the Currier Lumber Co., Detroit, Michigan.

RIGHT—Chase Style 198 Block Cars for high-pressure steam curing at L. G. Randolph Concrete Products Company plant, Ann Arbor, Michigan.



LEFT—Chase Style 294 Hinged-deck Lift-Truck Racks in the block plant of the Cleveland Builders Supply Company, Cleveland, Ohio.

BELOW—Chase Style 293 Hinged-deck Block Cars in service at Edmonds Art Stone Company, Washington, D. C.



Any Style or Design Lift-Truck Rack or Car for Your Plant

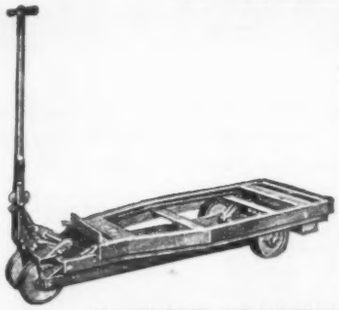
•

WRITE FOR CATALOG

THE CHASE FOUNDRY & MANUFACTURING CO.
Columbus 7, Ohio

BARRETT LIFT-TRUCKS

ONE MAN HANDLES 48 BLOCKS
NO BREAKAGE



Handle your green concrete products the way that more than 800 other concrete products plants do, WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage — joggling out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.
Write for illustrated circular.

BARRETT-CRAVENS COMPANY
3251 West 30th Street CHICAGO, ILL.
Representatives in all principal cities

Almost Any Job of Concrete Can be Done Faster with JAEGER TRUCK MIXERS

"HIGH DUMP"

Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

THE JAEGER MACHINE CO.,
602 Dublin Avenue
Columbus, Ohio

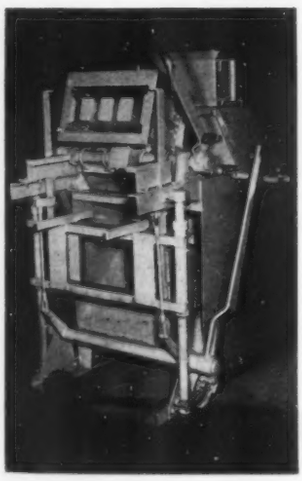
Mixers—Pumps—Hoists
Paving Equipment

or "LOW CHARGE" Type

The Kirkham Vibrator

CONCRETE BLOCK MACHINE

- ***Sturdy Construction.***
- ***Moderate in Price.***
- ***Low Upkeep.***
- ***Simplicity of Operation.***



Various size molds quickly interchangeable.

Liner plates in molds replaceable when worn.

Complete vibration insuring dense, durable blocks.

Plain wood or steel pallets adaptable to all boxes.

Concrete Transport Mixer Co.
650 Rosedale Avenue
St. Louis 12, Missouri

Make 6" to 48" CONCRETE PIPE with ONE Machine

Produce Pipe Profitably

Universal's "All-Purpose" Machine produces Concrete Pipe in all sizes from 6" to 48"—and shows you a worth-while profit. With a tamping capacity of 680 strokes per minute, your product is more dense, durable, finished in appearance. We can also outfit you for making larger sizes, up to 135".

Write today for Catalog and Details.

CONCRETE PIPE CO.
Columbus 15, Ohio

STEARNS JOLTCRETE No. 9

• • *Second "E" flag star awarded September 11, 1944.*

Note Recent Improvements: Automatic Power Carriage and Power Offbearer.

When you buy this machine HERE'S what you get

Super-production: Makes nine to eleven 8-in. blocks per minute.

Low Investment: Lowest first cost, including pallets, of any comparable machine.

Low Maintenance: Few working parts, few wearing parts, low replacement costs.

Flexibility: Makes all shapes and sizes of units with all types of aggregates.

Cored pallets with all their advantages.

One-Man Operation cuts production costs, adds to profit margin.

Joltcrete Blocks: There are no better blocks than Joltcretes.

Write today for new Joltcrete folder illustrating and describing No. 9 and No. 7 — a model of smaller capacity.

Performance Speaks Louder than Words

A FEW OF HUNDREDS

FABER CEMENT BLOCK COMPANY
Ridgewood, N. J.
Three No. 9 Joltcretes

ECONOMY BLOCK COMPANY
Wauwatosa, Wis.
Two No. 9 Joltcretes

CHANDLER MATERIALS COMPANY
Tulsa, Okla.
One No. 9 Joltcrete

ASK any STEARNS owner.

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

Designers and manufacturers of vibration and tamp type block and brick machines . . . Mixers . . . Skip Loaders. Licensed under the basic Gelbman Vibration Patents.

Baughman's Again Lead the Way!

New Self-Unloading Body cuts hauling costs to the bone.

MODEL J

Capacity 12 to 20 tons—
Unloading speed about 1 ton per minute.

Used with our popular Long or Short Wheel Base Model E, D, or H Machines for spreading, you will have the lowest cost lime distributing unit available.

Increase your profitable hauling range and make short hauls more profitable! New Semi-Steel Body.

Manufacturers of the famous "Hi-Speed" line of Self-Unloading Equipment.

Model E, Belt Conveyor Type	Model C, Cinder and Chip Spreader
Model D, Chain Conveyor Type	Model J, Transfer Type
Model H, Wide Chain Type	Model L, Car Unloader
Model F, Flat Bed Type	Model M, Car Unloader

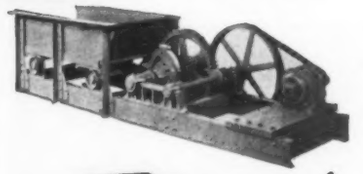
Ask for recommendations—we have a reliable distributor near you.

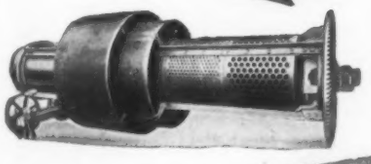
BAUGHMAN MANUFACTURING CO., Inc.
Factories • Jerseyville, Illinois

PRIORITIES WERE NEVER NEEDED FOR OUR EQUIPMENT!

McLANAHAN EQUIPMENT *for*

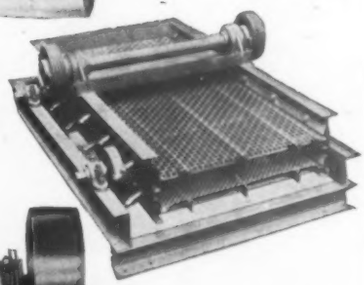
- **STONE**
- **SAND**
- **GRAVEL**

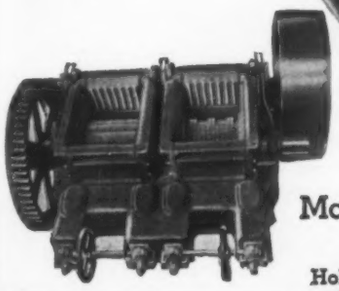




Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.





Let McLANAHAN & STONE solve your operating problems.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania

PROTECT
YOUR EQUIPMENT BY GETTING OIL TO ALL BEARINGS
On Time— All The Time
Lubricate the SURE Way!
with HILLS-McCANNA FORCE FEED Lubricators

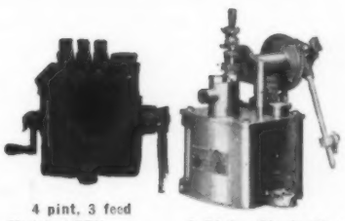
It's that shot of oil that gets to the bearings or friction surfaces just when it's needed that safeguards your costly investment in machinery and equipment.

And even though your lubricating schedules are followed strictly—there are chances that every bearing is not getting sufficient oil. *Neglect* and *forgetting* are ever present.

Hills-McCanna Force-Feed Lubricators solve the problem for good. And, you have the assurance that oil is getting to *all* the places that need it—*on time — all the time*. Each dose of oil is measured and fed at intervals to suit the speed —load and the thrust of your machinery and equipment.

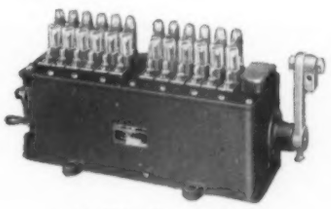
Being the pioneer manufacturers of force-feed lubricators, our engineers can offer you a wealth of experience in centralized lubrication. There are types and sizes to suit every need.

Tell us your problem —we'll do the rest— or write for Catalog L-44.

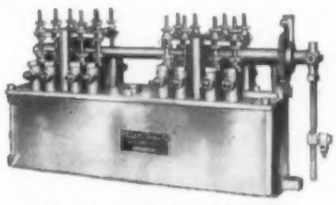


4 pint, 3 feed Model "ET" Type "VBF" Lubricator

2 Pint Single Feed Model "MB" Ratchet Driven Lubricator



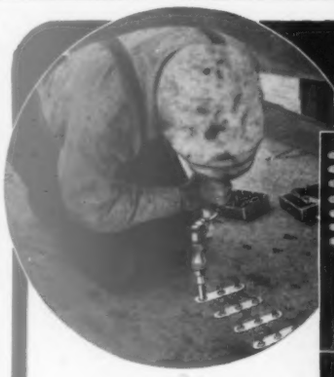
16 Pint, 12 Feed Model "ET", Type "VSF" Lubricator



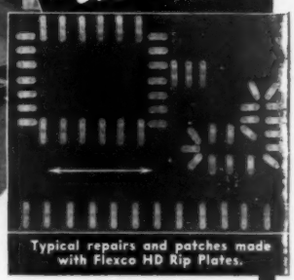
12 Pint, 16 Feed, Model "MB" Ratchet Driven Lubricator

6 Feed Hills-McCanna Lubricator feeding oil to 6 bearings on heavy crushing mill.

HILLS-McCANNA CO.
2359 NELSON STREET, CHICAGO, 18
PROPORTIONING PUMPS • AIR & WATER VALVES • CHEMICAL VALVES
MARINE VALVES • FORCED-FEED LUBRICATORS • DOWMETAL CASTINGS



A stitch in time!



Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

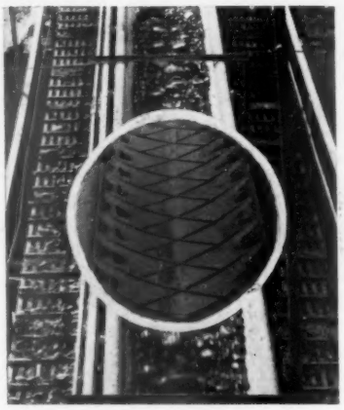
Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
4623 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS
REG. U.S. PAT. OFFICE
Sold by supply houses everywhere

AMERICAN LIGHTNING
ribbed centre
CONVEYOR BELT



The patented pattern of this belt, enables it to carry even wet loads up improbably steep grades without slipping. It is possibly the best belt in the world for conditions where slipping is bad.

The AMERICAN RUBBER Mfg. Co.

PARK AVENUE AND WATTS ST.

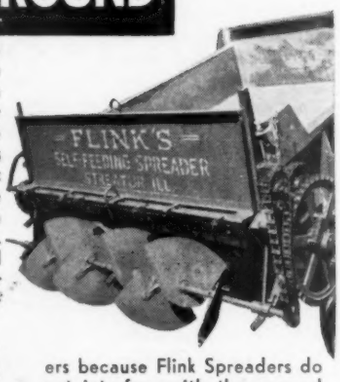
THE AMERICAN RUBBER MFG. CO. OAKLAND CALIF.

OAKLAND 8, CALIFORNIA

RUBBER PRODUCTS for INDUSTRY

HOW FLINK ONE MAN SPREADER PAYS WAY YEAR 'ROUND

No Helper Required on Back of Truck



It isn't possible to spread lime all the time. When fields are wet or crops are growing your lime spreader trucks can be used for other profitable jobs if they are equipped with Flink Self-Feeding Spreaders. The Flink fits all dump trucks as a replacement end gate . . . truck can still be used for all trucking and hauling jobs, for road work, for sand and cinder spreading.

You can make money with your Flink-equipped trucks 365 days in the year! Spread more lime in less time when lime spreading can be done. Use your trucks to do 101 other jobs when you can't spread lime. The expense of having one purpose lime spread trucks stand idle—which experienced operators estimate at $25 per day—is entirely avoided by men who use Flink Self-Feeding Spreaders because Flink Spreaders do not interfere with the general use of the truck.

Strictly a one man outfit. The driver of the truck operates the spreader from the cab.

Spreads wet or dry materials, thick or thin as desired, up to 1", 15' to 28' wide, depending on type of ground and nature of material.

Write for complete literature.

The FLINK COMPANY

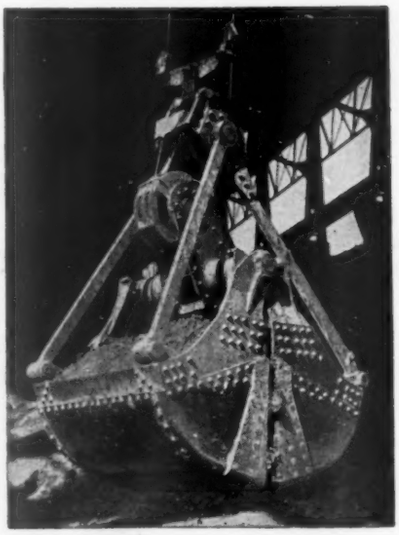
509 Vermilion — STREATOR, ILLINOIS

BLAW-KNOX BUCKETS

take the least of your crane time—handle more pay load

Send for the catalog which describes the bucket you need—

- No. 1853—Blaw-Knox Buckets for Cement, Chemical and Fertilizer Plants.
- No. 1696—Blaw-Knox Buckets for Single Drum Hoists for use on Railroads, Mills, Foundries, Etc.
- No. 1745—Blaw-Knox Buckets for "Burtoning" handling Nitrates, Grain, Potash, Etc.
- No. 1757—Blaw-Knox 2 Line Lever Arm Buckets for Rehandling, Barge Cleanup, General Purpose, Hard Digging, Dredging.
- No. 1865—Blaw-Knox 4 Rope Buckets for Coal, Ore and Cleanup.
- No. 1752—Blaw-Knox Buckets for Incinerator Service.



Installation of a Blaw-Knox Bucket at a "trouble-spot" takes that worry off your mind—definitely—for each bucket is tailor-made for its particular job.

For digging and rehandling the many bulk materials throughout industry there's a Blaw-Knox Bucket.

You can select a bucket from the many interesting catalogs listed above.

BLAW-KNOX DIVISION of Blaw-Knox Co.
2068 FARMERS BANK BUILDING, PITTSBURGH, PA.
NEW YORK · CHICAGO · PHILADELPHIA · BIRMINGHAM · WASHINGTON

Call COLUMBUS for Heavy Duty Quarry Equipment

NOW IS THE TIME to plan the re-equipment of your plant for increasing postwar profits.

COLUMBUS Modern Material Handling Equipment is a "short-cut" to maximum output and minimum operating costs.

COLUMBUS Elevator in stone quarry

"Bulletin No. 155" describes our machines for ELEVATING CONVEYING CRUSHING SCREENING TRANSMISSION

EVERYTHING FROM A COMPLETE PLANT TO A BUCKET . . . can be furnished and on a real economy basis.

The COLUMBUS CONVEYOR CO., Columbus 8, Ohio

Some territory open for responsible representatives.

GRUENDLER CRAFTSMANSHIP

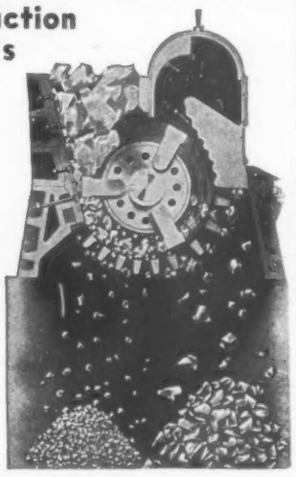
Serving Industry over 50 Years

Continuous Peak Production in Cement Plants

Depends Largely on Crushing Equipment

GRUENDLER CRUSHERS and PULVERIZERS

of heavy duty types with capacities to 300 tons per hour and larger — produce uniform fine product to increase capacities of Ball, Rod or Compeb Mills.



Cut-away View of Hammer Crusher

Mfrs. of Double Roll & Hammer Crushers for Primary & Secondary Crushing

ROLL CRUSHERS
PULVERIZERS
CONVEYORS
CRUSHERS
FEEDERS
MIXERS

BULLETIN on large capacity HAMMER-MILLS mailed on request

GRUENDLER

CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

Link-Belt "UP" vibrating screen separating silica sand.

ACCURATE SCREENING

• Screening equipment is of first importance to National Pulverizing Co., Millville, N. J., whose product—silica sand—is accurately graded to seven sizes. Starting 15 years ago with 8 Link-Belt vibrating screens, they have since purchased 7 additional units. As in numerous other installations, Link-Belt vibrating screens have shown the way to accurate separation and lowest operating cost. The whole story of their economy and smooth, trouble-free operation is given in Book No. 1762. Send for a copy today.

LINK-BELT COMPANY 8694-A
2045 W. Hunting Park, Philadelphia

WRITE TODAY! **LINK-BELT Vibrating Screens**

PRECISION-GROUND CAMSHAFTS

another "HIDDEN VALUE" in all WISCONSIN Air-Cooled ENGINES

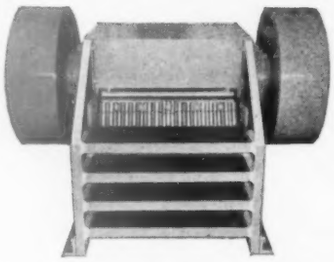
The "Camomatic" is another of those more-than-human machines that help to put heavy-duty serviceability and smooth-running efficiency into every Wisconsin Engine.

This machine automatically rough-grinds (and subsequently "smooth-finishes") each and every cam for every Wisconsin Air-Cooled Engine. The grinding wheel finishes cam contour with absolute precision and uniformity. Every camshaft for a given size engine, is exactly like all the other camshafts for all the other engines of that size.

This is another of those features you *don't* "see" . . . but it performs an important service for you on the job, on your equipment.

Most H.P. per pound **WISCONSIN MOTOR** Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

4-STAR CRUSHING PERFORMANCE



Crushed stone operators who "lead the parade" for large-scale, low-cost production, rely on EAGLE Crushers *because*

★ EAGLES are exceptionally rugged and durable, with reversible jaws and cheek plates for extra wear.

★ EAGLES work on economical power and maintenance basis, and show larger operating profits.

★ EAGLES assure high product uniformity and marketability.

★ EAGLES are available in capacities ranging up to 1500 tons per day.

Territory open for responsible distributors

Write for Bulletins

EAGLE

JAW CRUSHERS
IMPACT BREAKERS
PULVERIZERS
CONVEYORS
LOADERS

EAGLE CRUSHER CO., Inc., Galion, Ohio

SCREEN SERVICE!

RUGGED, DURABLE AND ACCURATE
ALL METALS ALL WEAVES

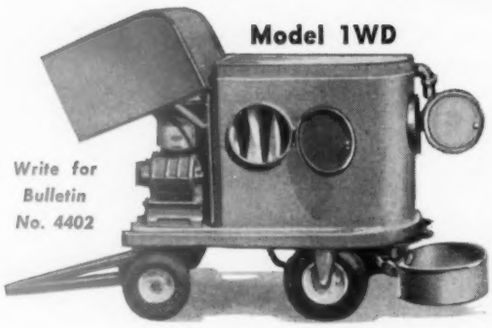
FOR ANY INDUSTRIAL APPLICATION

THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 78TH STREET CLEVELAND, OHIO

25 to 33 PERCENT *FASTER* DRILLING

MARKLEY-CARTER
PORTABLE DUST COLLECTOR
"Collects and Controls"



Write for Bulletin No. 4402

It's defeat day for dangerous and costly dusts on your rock drilling jobs.

This modern protective method

- Reduces silicosis hazard to safe hygienic limits
- Increases drilling speed up to 33%
- Reduces sharpening expense
- Reduces drillsteel wear
- Eliminates wet drilling

Keeps plant, motors, and machinery clean and free from harmful dusts.

RALPH B. CARTER COMPANY
192 ATLANTIC ST., HACKENSACK, N. J. 53 PARK PL., N.Y. 7, N.Y.

for Making 1¼", ¾" or Agricultural Limestone...

THE WILLIAMS "SLUGGER" CRUSHER AND PULVERIZER

● Handles Large Stone or Screen Rejects ●

Rows of heavy, free swinging, fast revolving hammers, crush the material by impact until of proper size to pass through the grates. By reducing large rock to 1¼", ¾" or agricultural size in one operation, the "Slugger" has enabled operators to produce these sizes at a very low cost per ton and with small investment. Seven sizes—6 to 150 tons hourly capacity.

The Williams Patent Crusher and Pulverizer Co.
802 St. Louis Ave. St. Louis 6, Mo.

Williams
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
PATENT CRUSHERS GRINDERS SHREDDERS

AIR SEPARATORS
ROLLER MILLS
CRUSHERS
GRINDERS
SHREDDERS

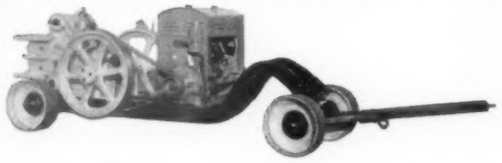
GOOD FOR ROUND TRIPS
RELIANCE
TO THE JOB AND BACK

NOW you can reach profitable jobs for miles around with the speedy Reliance portable rock crushing plant. It includes crusher, elevator, chute screen, engine and drive, complete and ready for action.

Compact unit is mounted on a four-wheel truck, steel or pneumatic tires. Low feed opening. V-belt drive. Engine fitted with clutch for easy starting.

RELIANCE Products include: Rock Crushers, Bucket Elevators, Revolving Screens, Street Sweepers, Storage Bins, Chip Spreaders, Belt Conveyors, Feeders, Separators, and other equipment.

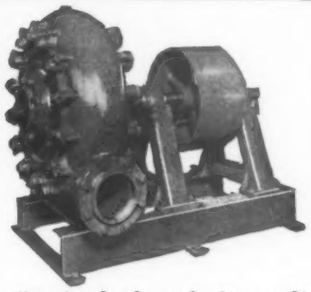
PORTABLE CRUSHING PLANT



Write for Information

Universal Road Machinery Co.
KINGSTON, NEW YORK

The Lightning
Sand and Gravel Pumps
HEAVY-DUTY
(Ball-Bearing)
and Low Head Types



Complete stock of replacement parts, elbows and fittings carried for prompt shipment.

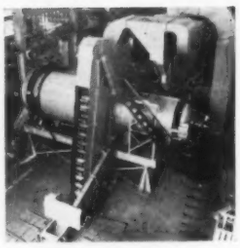
Replacement parts made to jig standards and always fit and always available.
For 30 years LIGHTNING pumps have faithfully performed the work they are intended for. We manufacture a type and size to fit the need. Simplicity of design and ease of handling have made these pumps one of the most popular. Write for catalog now.

Mfg. by
KANSAS CITY HAY PRESS CO., KANSAS CITY, MO.

ROUND
SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
*Reg. U. S. Pat. Off.

HENDRICK MANUFACTURING CO.
39 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities. Please Consult Telephone Directory.

SIMPLICITY
ASPHALT PLANTS and INDUSTRIAL DRYERS
combine the best in
DESIGN
MATERIALS
WORKMANSHIP
CAPACITY
PORTABILITY
ECONOMY
to insure complete
DEPENDABILITY



Write for Bulletin.
THE SIMPLICITY SYSTEM CO.
Chattanooga, Tennessee

DIAMOND CORE DRILLING
CONTRACTORS
Fire Clays, Coal, Limestone
Gravel Deposits, All Minerals

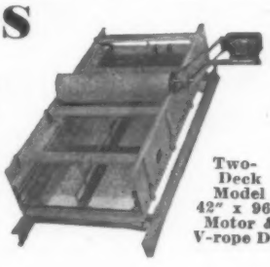
MOTT
CORE DRILLING CO.
HUNTINGTON, W. VA.

UNIVERSAL SCREENS

GUARANTEED to give you best results on your most difficult separations.

RUGGED - SIMPLE Construction. LOWEST in FIRST cost and MAINTENANCE cost.

Catalog No. 107,—32 pages on Screens and Screening is yours for the asking.

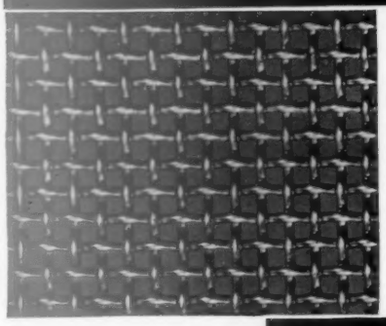


Two-Deck Model 42" x 96", Motor & V-rope Dr.

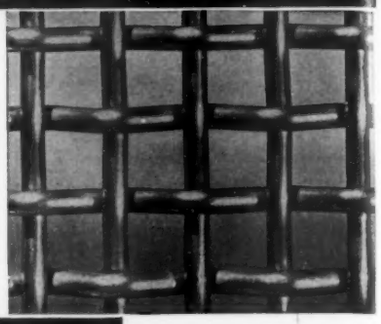
UNIVERSAL VIBRATING SCREEN CO.
RACINE - - WISCONSIN

T. C.
Woven Wire
SCREENS
Half-Century of Dependability
For
ACCURACY
ENDURANCE
ECONOMY
SQUARE OPENING
OBLONG OPENING
Standard and Special Weaves
TWIN CITY IRON & WIRE CO., St. Paul, Minnesota

Trade Mark of ACCURATE, DEPENDABLE WIRE SCREENS



THE TYLER TRADE MARK REG. U. S. PAT. OFFICE DOUBLE CRIMPED



THE W. S. TYLER COMPANY, Cleveland 14, Ohio

CHEMICALS ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS

POWDER COMPANY

Wilmington • Delaware

NAT-ALOY WIRE CLOTH

☒ VOTE **"YES"**

For this dependable, non-crystallizing, long-wearing Screen Cloth with "Nat-Aloy" Lock Crimp Meshes.

"IT'S THE PEOPLE'S CHOICE"

among profit-wise producers for precision separation and economical operation.

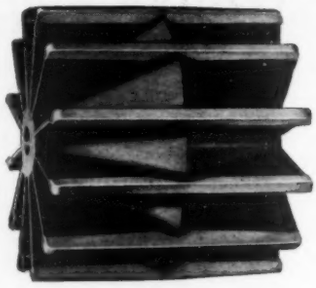
Stock shipments in all widths and all meshes. . . . Write for catalog No. 55.

NATIONAL WIRE CLOTH CO., INC.

252-270 W. FAIRFIELD AVE. — ST. PAUL, MINN.

THOUSANDS OF USERS TESTIFY

that the **Belt-Saver Pulley** saves money and rubber and prevents accidents on their belt conveyors and bucket elevators.



Write for more information!

SPROUT, WALDRON & COMPANY

136 Sherman Street — Muncy, Pa.

DIAMOND *BALANCED* VIBRATORS

DIAMOND

Violent vibration for fast, positive separation *all* over the screen—controlled by accurately balanced design for smooth action. Long life, low maintenance costs. No choking. Fast delivery. 11 Sizes in 1-2-2½-3-4 Decks. Tell us your needs. Write for Bulletin D42V.

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1801 NORTH SECOND ST., MINNEAPOLIS 11, MINNESOTA

DENVER HYDROCLASSIFIERS

for fine sizing

and desliming problems, this machine has proved very efficient both in metallurgical results and in mechanical operation. Enclosed lifting device and spiral rakes are distinctive advantages. It will do the work of any hydroseparator. Write for new Bulletin No. C4A-B

24 YEARS' EXPERIENCE COMPANY

NEW YORK CITY, NEW YORK: 50 Church St. MEXICO, D.F.: Edificio Jakzee, Calle Ejido No. 7

CHICAGO: Suite 1005, 69 W. Washington St. MIDDLESEX, ENG.: 493A, Northolt Rd. S. Harrow

SALT LAKE CITY, UTAH: 737 McIntyre Bldg. RICHMOND, AUSTRALIA: 530 Victoria Street

TORONTO, ONTARIO: 45 Richmond St. W. JOHANNESBURG, S. AFRICA: 6 Village Road

STANDARD DESIGNS EFFICIENT

DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado

Condor RUBBER PRODUCTS

BELTING

Conveyor, Elevator, Compensated, Transmission, Agricultural and V-Belts. Belting for every Service.

HOSE

Air, Acid, Contractors, Fire, Hydraulic, Oil and Gasoline, Steam, Sand Blast, Suction, Water, Spray and Special Hose. 81 Kinds for 81 Uses.

OTHER PRODUCTS

Chute Lining, Molded Rubber Goods, Industrial Brake Blocks and Lining, Rubber Lined Tanks, Rubber Covered Rolls — Abrasive Wheels, Bowling Balls.

Keep Ahead with **MANHATTAN**

THE MANHATTAN RUBBER MFG. DIVISION

OF RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICES AND FACTORIES, PASSAIC, NEW JERSEY

FOR SALE

2—2′ Symons Cone Reduction Crushers.
2—3′ Symons Cone Reduction Crushers.
2—4′ Symons Cone Reduction Crushers.
1—5½′ Symons Cone Reduction Crusher.
1—7′ Symons Cone Reduction Crusher.
6″ x 6″ Air Compressor complete with 15 H. P. 220 V. 3 ph. 60 cy. motor.
5—30 to 100 Ton Steel Guy Derricks.
10—Overhead Electric Traveling Cranes.
2—4 ton floor controlled 220/3/60—46′ span cranes.

National Equipment Company
400 West First Street
Phone 4361 Bloomington, Indiana
Need any used items?
Have any for sale?

1—Wisconsin Foundry Portable Gravel Plant, 936 RB Jaw, 24x18 rolls, vibrating screen, shovel-loading hopper, bucket return. Solid rubber tires.
1—Lippman Pulverizer 15x32 RB, reciprocating feeder, under conveyor, solids.
1—Universal 35′ Bucket Elevator Line, almost new.
1—Indiana 918 Jaw Crusher, bucket elevator.
1—Caterpillar "30" Tractor w/bulldozer.
1—Davey "105D" Compressor, pneumatics.
2—Waukesha-Hesselman 46 HP Power Units.
1—Continental 60 HP Gas Power Unit.
2—Buda 117 HP Diesel Power Units.

Eighmy Equipment Company
ROCHELLE, ILLINOIS

One—Senior Polk System Bin Building equipment, complete and like new.

EUREKA SILO COMPANY
Silver Lake, Indiana Phone 3751

SPECIAL ITEMS FOR SALE

Barber-Greene Model 42 crawler gas disc type bucket loader, capacity 1¾ yards per minute. First-class condition.
Monighan No. 3 Diesel dragline, 3-yard bucket, 80′ boom.
Bucyrus 20-B crawler gas crane and dragline, ¾-yard bucket.
Orton crawler gas crane with ½-yard bucket, 30′ boom.
P&H combinaiton shovel, crane and dragline, one yard.
All the above overhauled, ready for work. Immediate delivery. Low priced.

THE ACME EQUIPMENT COMPANY
14057 Schaefer Highway
Detroit 27, Michigan

PRICED RIGHT

1—Fuller Kinyon Type C Portable Transport Pump for unloading dry pulverized materials from box cars, bins, etc., 12 to 15 ton per hour, motor driven.
1—Vulcan 6′x42′ Rotary Dryer, ½″ shell, located West Coast.
1—Set of Crushing Roll, 28″x15″.
1—Blake Jaw Crusher, 9″x14″.
1—Oliver Rotary Continuous Filter, 5′x8′.
10—Bucket Elevators 20′ to 75′.
8—Belt Conveyors, 20′ to 50′.
5—Tyler Screens, 3′x5′, 4′x5′.
1—Jeffrey Hammer Mills, 24″x18″.

Partial List Only

WANTED: Crushers, Dryers, Pulverizer, etc. Send us your list.

BRILL Equipment Co.
225 WEST 34th STREET, NEW YORK 1, N.Y.

SHOVELS—CRANES

Marion 371, 1¾ yd. Shovel, Crane, Dragline
Bucyrus-Erie 42B Steam shovel-crane
General ½ yd. Diesel crane
P & H 650 shovel-crane
Bucyrus-Erie 20B 1 yd. electric tunnel shovel
Link-Belt K2 Caterpillar Crane, 55″ bm.
Koehring 301 Shovel & Crane, ¾ yd.
Northwest No. 3 Crane, Shovel & Backhoe
Northwest No. 6 Shovel, Crane, Dragline
Browning 10 ton Truck Crane
P & H 203A, 8 ton Truck Crane
Byers Bearcat ½ revolving Crane, 5 tons cap.

SPECIALS!!

Ingersoll-Rand Model 50 Drill Sharpener
Allis-Chalmers cent. pump, electric, 3500 GPM, 50′
Worthington 8″ cent. bronze impeller, elec. Pump
Rotary Screen 4′x18′ with Bucket Elevator 40′

BUCKETS—STONE SKIPS

⅞ yd. Blaw-Knox Clamshell, digging
⅞ yd. Hayward Clamshell, digging
Hayward ¾ yd. Standard Orange Peel
⅝ yd. Williams Clamshell, digging
⅝ yd. Haiss Clamshell, digging
½ yard Haiss Clamshell, rehandling
¾ yard Haiss Clamshell, rehandling
Erie ¾ yd. Clamshell, rehandling
20—2½ to 3 yd. Battleship type Steel Stone Skips

TRACTORS—BULLDOZERS

D7 caterpillar tractor with bulldozer
Int. TD 18 tractor with angledozer
Allis-Chalmers HD10 with bulldozer
Int. TD35 with bulldozer
Int. TD14 with bulldozer, rebuilt

CRUSHERS—CRUSHER PLANTS

Gyratory Crushers: K.V.S. 30, 49; Traylor 8″, 10″, 12″, 14″, McCully 13″, 8″, 6″.
Jaw: 10x22, 10x24, 10x30, 11x18, 11x21, 12x22, 12x24, 14x24, 14x25, 15x32, 16x32, 16x38

LOCOMOTIVES—CARS

American 60 ton, steam, std. ga.
American 45 ton, Saddle Tank
Plymouth 35 ton, std. gauge gas
Baldwin 20 ton, 36″ gauge, Saddle Tank
Vulcan 30 ton Steam, Saddle Tank
Whitcomb 14 ton, Diesel, 36″ gauge
Porter 13 ton, Steam Saddle Tank, 36″ gauge
Davenport, 10 ton, std. gauge locomotive
Baldwin Westinghouse 8 ton, 36″ ga. Battery
Vulcan 6 ton, 36″ gauge, gas
3—Western Steel 20 yard Air Dump Cars
3—30 ton Standard Gauge Flat Cars, rebuilt

CONCRETE PLANT & EQUIPMENT

2—Ransome 28S Mixers on skids, left and right hand
Koehring 34E Dual Drum Power
Fuller Kinyon Bulk cement unloader
Pauers—27E—2 Koehring, 1 Multi-Foote 1 Rex
Rex Pumperete Models 160, 180, 190 and 200
Finishing machines from 10′ up to 32 ft.

RICHARD P. WALSH COMPANY
30 Church St. New York, N. Y.

RAILS NEW AND RELAYING
TRACK ACCESSORIES
from 5 Warehouses
L. B. FOSTER COMPANY
PITTSBURGH • CHICAGO • NEW YORK

FOR SALE

1—250 & 187 KVA AC Gens. D/C Unaflows
5—520 HP Heine 200# W. T. Boilers
1—28 Northwest Dragline; 35 HP Boiler
1—600 HP Syn. Motor; 65 HP Loco. Boiler
1—1¼ Yd. Diesel Shovel; 50 KVA Eng.—Gen.
1—750 HP Diesel; 125 KW Motor Gen. Set.
2—78x18 ASME Code 150# HRT Boilers
1—100 KVA AC Gen. D/C Full Diesel

H. & P. MACHINERY CO., 6719 Etzel, St. Louis, Mo.

FOR SALE

1—¾ Yd. P&H 400 Crane & Dragline.
1—1¼ Yd. Lorain 75-A Shovel.
1—1¼ Yd. Osgood Shovel.
1—1¼ Yd. P&H 700 Shovel & Dragline.
1—2 Yd. P&H 780 Dragline—Diesel.
1—20 ton Browning Locomotive Crane.
1—No. 2 Northwest Shovel Attachment.
1—No. 35 Universal Back-Hoe Attachment.
1—¾ Yd. McMyler Digging Bucket.
1—150 ton Steel Bin.
1—10x16 Universal Jaw Crusher.
1—8 ton Plymouth 36″ Locomotive.
1—Sand & Gravel Plant in western Pennsylvania for sale as a going business. Good opportunity. Details on request.

• • •

PATTERSON EQUIPMENT COMPANY
1468 West 9th Street Cleveland 13, Ohio
Phone—Cherry 0439

FOR SALE

Complete Quarry Machinery and Equipment consisting of Crushers, Air Compressor, Elevators, Screens, Bins, Air Hammers, Ventilating Fans, Large Ottumwa Hoist—all powered by 3 phase, 60 cycle Motors with complete control. Numerous tools and equipment for 600 ton daily production.

BETHANY FALLS STONE COMPANY
505 Main Street St. Joseph 12, Missouri

FOR SALE

No. 9 Allis-Chalmers Style K Crusher in good shape.
3 yard friction hoist, complete with electric motor and V-belt drive.

Box 945, c/o Pit and Quarry, 538 So. Clark St., Chicago 5.

FOR SALE

13″ x 36″ Stevenson Single Roll Crusher.
9″ x 36″ Wheeling Jaw Crusher.
9″ x 15″ Phillips Jaw Crusher.
No. 4 Champion Jaw Crusher.
No. 1 Williams Hammermill Crusher.

PITTSBURGH MACHINERY & EQUIPMENT CO.
Aspinwall Pennsylvania

DEPENDABLE USED MACHINES

SPECIAL—WILLIAMS NO. 6 HAMMERMILL, CAPACITY 30 TONS PER HOUR AGSTONE

A-C "K" angledozer
75 ton steel bins
2 yd. Koppel cars, 36 in. clam buckets, all sizes
Belt conveyors and parts
Link-Belt ¾ yd. crane
10 x 20 portable crusher
Byers 1 yd. dragline
Claridge No. 80 fan
Pioneer Duplex gravel plant
Day 10 x 18 hammermill
Link-Belt bucket loader
42 x 72 Robins screen
10 ton Holt tractor
36 in. gauge turntable

TRACTOR & EQUIPMENT COMPANY
3506 West 51st Street Chicago 32, Illinois

CRUSHERS

1—28″ x 36″ Webb City Iron Wks. Roller Brg. Jaw Crusher with 75 HP 860 RPM 440 V West. type C. W. var. spd. motor. V-Belt Drive.
1—18″ x 30″ Telsmith Wheeling Roller Brg. with 50 HP 440 V West. type C. W. var. spd. motor, and V-Belt Drive.
1—36″ Telsmith gyrosphere with 60 HP West. type C. W. var. spd. motor, 440 V V-Belt Drive.
1—20″ Traylor type TY secondary red. with 25 HP 440 V motor.
1—9″ x 15″ Traylor Chalmers Blake type with 15 HP motor.

SCREENS — VIBRATING

2—5′ x 4′ Leahy heavy duty Concenco type C 1 HP motor.
2—3′ x 4′ D. D. Symons mod. J. W. 7-2 with 5 HP motors.
1—4′ x 8′ Mod. K42-2 with 7½ HP motor.
2—3′6″ x 6′ S. D. Symons—JW8-7 with 5 HP motor.

CONVEYORS

1—30″ Conv. Belt 55′ center with Thr. Rolls, idlers, Hd. and T. Pulleys, 7½ HP gearmotor and drive.
1—20″-160′ centers with Belt, Thr. Rolls, idlers, Hd. and T. Pulleys, spur gear red. 10 HP motor and V-Belt Drive.
1—16″-48′ centers, Stacker conveyor on steel frame with Thr. Rolls, idlers, Hd. and T. Pulleys, 3 HP gearhead motor. V-Belt Drive.

Also large stock Air Compressors, Motors, Transformers, Drills, Drill Steel, etc.

PACIFIC MACHINERY COMPANY
156 MONTGOMERY STREET, SAN FRANCISCO, CALIFORNIA Phone Sutter 3943-44

STANHOPE OFFERS!

AIR COMPRESSORS
BELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1722 & 2850 Ft.
DIESEL: 105, 315, 420, 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300 & 2200 Ft.

GRAPPLES & BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
5 Owen & Bucyrus Rock Grabs.
CLAMSHELL: ½, ¾, 1, 1½ & 2 Yds.
ORANGE PEEL: ¾, 1, 1½, 2 & 3 Yds.
DRAGLINE: ½, ¾, 1, 1½ & 2 Yds. Cap.

CRANES & DRAGLINES
5 Ton BROWNHOIST, 30 Ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
16 Ton Speedcrane, Gas, 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
2 Yd. Monighan Electric 60 ft. Boom Dragline.
3 Yd. Monighan Diesel Dragline.
5 Yd. Monighan Diesel Dragline.

CATERPILLAR SHOVELS
½ Yd. P. & H. Gas & ⅜ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1½ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel.
1½ Yd. KOEHRING 601—Gas.

DUMP CARS
46—KOPPEL, 1½ Yd., 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Sd. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5'x22" HARDINGE CONICAL Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x6, & 10x9 Straight Ball Mills.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x18, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 5x12 and 6x12 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Lining.
5½x18 P & M Tube Mill Silex.

PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto, Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x20 Diamond Double Roll.
24x24 & 36x16 & 36x20 Diamond Double Roll.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
30x10 Gruendler Roller Bearing.

CONE & GYRATORY CRUSHERS
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
21K & 18N Allis Chalmers.
4—10 TZ Traylor 4 Ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T, Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullys.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.
7 Ft., 5 Ft., 4 Ft., 3 Ft. and 2 Ft. Symons Cone.

DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2.
29T ARMSTRONG Well Drill.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

HAMMER MILLS
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Greundler No. 6X.

MIXERS—PAVERS
5—1 yd. 2 yd. & 3 yd. Mixers.
3—Ransome & Rex 34E Dual Drum.
5—Koehring & Smith 27E Pavers.

ASPHALT EQUIPMENT
7—750 & 1000 Gal. Distributor Trucks.
3—1000 Lb. & 2000 Lb. Pug Mixers.
6—3, 5, & 10 Ton Asphalt Rollers.
5—½, 1, & 2 Ton Asphalt Plants.

DIESEL ENGINES
60 HP Fairbanks Morse.
140 HP Fairbanks Morse.
200 HP Atlas.

DIESEL GENERATORS
240 K.W. F.M. 3/60/2300 v.
300 K.W. Worthington 3/60/2400 v.
125 K.W. F.M. 250 v. D.C.
30 K.W. Buda 110 v.

RAYMOND MILL
5 Roll High Side.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 In., 30 In. & 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
DIESEL: 7—4½, 8 and 15 Ton 36 x42 In. Ga.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72. HUMMER, ROTEX, NIAGARA & ROBINS, LINK BELT & HURON.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20.

STEEL STORAGE TANKS
35—4000, 5000, 6000, 8000, 10000, 15000 and 20000 gal. cap. Horizontal and Vertical.
50000 gal. on 100 ft. tower.
60000 gal. on 85 ft. tower.
100000 gal. on 100 ft. tower.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1— ¾ yd. Gas 1—1½ yd. Electric
1—1 yd. Electric 3—2 yd. 3 yd. & 4 yd. Electric

R. R. TRACK SCALE
125 Ton 56' x 10'6" Platform 4 Section.

WHIRLEY CRANES
5 Clyde 75 to 100 Ft. Bcom.

DRILL SHARPENERS
5 I.R. 4K Shank Grinders.
6 Ingersoll-Rand 54, 40, 50 & 34's.
7 Sullivan Class A, & C.
8 Gardner-Denver 3A & No. 6DS.

MINE LOADERS
5 Eimco, GD, & Conway.

(Cable Address: "STANEQUIP" New York)
Lincoln Bldg., 60 E. 42nd St., New York, N. Y.
Murray Hill 2-3075 or 2-3076

R. C. STANHOPE, INC.

LOCOMOTIVES
1—6-Ton Gas Locomotive, 36" Ga., Milwaukee Locomotive Works
1—9-Ton Gas, 36" Ga., Whitcomb
1—8-Ton 0-4-0 Vulcan, S/G. Ex. Cond.
2—25-Ton 0-4-0 Porter Saddle Tank Locos. Oil burners; A. S. M. E. Code, Excel. Cond.
2—43-Ton Baldwin-Westinghouse Electric Locomotives, 600 Volt D.C.
1—50-Ton 0-6-0 Vulcan Locomotive
1—60-Ton Westinghouse Electric Locomotive, 550 volt D.C.
1—65-Ton 2-6-0 Mogul Loco. Oil-burning
1—70-Ton 0-6-0 Baldwin Switching Loco. ICC condition.
2—70-Ton Baldwin-Westinghouse Electric Loco., 600 Volt D.C.
1—70-Ton Gas-Electric Locomotive
1—80-Ton 0-6-0 Lima Switching Loco. Excellent condition.

Other Locomotives, Too

IRON & STEEL PRODUCTS, INC.
39 years' experience
"ANYTHING containing IRON or STEEL"
13490 S. Brainard Ave., Chicago 33, Illinois

1—Austin-Western 4 x 40 Jaw Crusher, New Roller Bearings

1—Farrel-Bacon 18 x 36 Jaw Crusher

2—1½ yard Dempster Dumptors Model LF, ready for mounting on trucks with buckets

1—1½ yard Brooks Load Lugger with buckets

1—Iowa Model KD 9 x 16 Portable Jaw Crusher with Model 20 International Power Unit, all mounted on four pneumatic tires, self propelled.

• • •

The Lorenz Equipment Company
547 West Rich St., Columbus 8, Ohio

FOR SALE

Plymouth and Milwaukee gas locomotives, 8, 12, 25, 35 tons; 36" and std. ga., A-1.
Davenport, Porter, Vulcan 18 to 20-ton steam 36" gauge S/T locomotives, (4), rebuilt.
Vulcan 18-ton steam S/T locomotive, 42" gauge.
Porter 59-ton steam S/T locomotives, (2), std. ga.
Bucyrus 50B and 80B steam crawler shovels.
Pioneer 300W portable gravel washing plant.
Gyratory crushers, 12", 21", 27"; 7" Newhouse.
Page Diesel 2-yd. Walking dragline, 65' boom.
Euclid 6-yd. bottom dump crawler wagons (8).
Sturtevant No. 2 rotary fine crusher.
Toepfer revolving gravel screen, 48"x18'.
Monighan 3-yd. electric Walking dragline.
P&H ¾-yd. gas shovel, Model 204, 19' boom.
American 85-ton steam locomotives, 0-6-0, (3).
Hydroelectric plant, 1000 HP, 60' head, A.C.
Bucyrus 50B 2-yd. Diesel cranes, 60' boom.
Boiler tubes, 236—1¾"x5', ferrules, new.

H. Y. SMITH COMPANY
828 N. Broadway — Milwaukee 2, Wisconsin

LOCOMOTIVES
SHOVELS CRANES
CARS

1—42½ ton Porter 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, entire new firebox, rebuilt.

1—26 ton American 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, thoroughly overhauled.

1—72½ ton Baldwin 0-6-0 separate tender switcher, full time I.I.C. papers, overhauled.

1—Whitcomb diesel locomotive, 36" gauge, with Caterpillar V-8 engine, air brakes, electric lights. This locomotive built in 1936 and has now been put in first class serviceable condition with new wheels, chains, sprockets, reversing gear, and bronze clutch plates. Weight is 20 tons in full working order.

3—Western 20 yard two way air operated side dump cars, standard gauge, **DROP DOOR TYPE,** first class condition.

BIRMINGHAM RAIL & LOCOMOTIVE COMPANY
Birmingham 1, Alabama

PLANT EQUIPMENT

STEEL TANK ON TOWER 22,000 gal. capacity on 50' tower

2—100-ton Watson-Stillman Hydraulic Jacks

4 New Gyroset Vibrating Screens. Screening Surface 24 x 48"

All types conveying equipment built to specifications

ELECTRIC MOTORS — up to 100 HP

•

INLAND EQUIPMENT COMPANY
P. O. Box 477
Nashville 2, Tennessee

GASOLINE ENGINES

We have the following new and used gasoline engines ready to go:

4 new large 125 h.p. valve-in-head Buda motors
3 new large 115 h.p. valve-in-head Continental motors
1 new 90 h.p. Streamline Continental
2 large 125 h.p. valve-in-head Budas, rebuilt and like new
1 104 h.p. Buda motor, rebuilt and like new
1 90 h.p. Continental, valve-in-head, rebuilt
3 rebuilt 90 h.p. Buda motors
7 rebuilt 80 h.p. Continentals
1 rebuilt 6-110 Waukesha
1 used 90 h.p. diesel, as is

All motors are fully equipped with self-starters, generators, large radiators, Twin-Disc clutches, etc. Write for prices and details.

Iowa Portable Mill Company
Phone 111
George Lonien — Oelwein, Iowa
Dept. "Q"

---

4 OFFICES and PLANTS

CHICAGO	NEW YORK
11556 Wadsworth Ave.	30 Church St., Dept. ENR
PITTSBURGH	**PHILADELPHIA**
P. O. Box 4953, Dept. ENR	1503 Race St.

EQUIPMENT CORPORATION of AMERICA

WE SERVE 4 WAYS
BUY | REBUILD
SELL | RENT

4

IMMEDIATE DELIVERY

15 ton, 22'x9' Bonded Motor Truck Scale $440.00
20 ton, 24'x10' Bonded Motor Truck Scale $575.00
30 ton, 34'x10' Bonded Motor Truck Scale $1040.00
3'x6' Single Deck, Bonded Vibrating Screen $495.00
3'x8' Double Deck, Bonded Vibrating Screen $685.00
3'x8' Three Deck Bonded Vibrating Screen $885.00
Bonded Stoker Coal Crusher...$345.00

BONDED SCALE CO.
110 Bellview, Columbus 7, Ohio
Scale, Vibrating Screen, and Crusher Mfrs.

FOR SALE

Wisconsin Power Unit
Type E .....No. 1171
6 Cyls. 6"x7"
Starter - Generator
Clutch
Overhauled
On Steel Skids

• •

LATTA BROOK SAND AND GRAVEL CORPORATION
East Franklin Street
HORSEHEADS, NEW YORK

FOR SALE

1—Telsmith No. 6 Sand Tank.
1—Concrete Mixer 7 S Knickerbocker.
1—P & H 206—¾ yd. crane with Page dragline bucket and fairleads, Mead-Morrison clamshell, 40' boom and 5' detachable extension. This machine can be seen in operation.
1—Kern 2 speed, 2 drum, 1 yard drag scraper hoist. Includes ¾ yd. Sauerman Crescent scraper and 3 Sauerman durolite blocks. 1200 ft. of good cable.
1—½ yd. Smith hoist, 2 drum, with 35 H.P. Hercules gas engine with ½ yd. Sauerman scraper.
2—4" Novo Portable self-priming pumps (rebuilt) with direct connected gas engines. Complete with suction hose and strainer.
1—Bay City ½ yd. ½ swing combination dragline and clamshell 30 ft. boom.
1—1/3 yd. Sauerman Crescent scraper.

FRICKE SAND & GRAVEL CO.
PARK RIDGE, ILLINOIS
Office phone: Park Ridge 1443
Residence phone: Park Ridge 1752

CONVEYORS

2—36" x 600 ft. each, center to center.
1—36" x 270 ft. center to center.
1—36" x 320 ft. center to center.
All roller bearing equipped with new belt.

DIESEL MOTORS

2—Cummins 200 H.P., supercharged Diesel Motors for use in Euclid and other similar heavy trucks.

JAW CRUSHERS

1—Traylor 36 x 42, with or without Pan Feeder.
1—Pioneer 30 x 42, all steel, roller bearing, with feeder.

LOCOMOTIVES

1—Lima 80 ton, 6 wheel, Switcher with piston valve, with tender, superheater, code boiler, 200 lbs. pressure, electric lights, Walschaert valve motion, automatic lubrication; thoroughly modern, excellent condition, immediate delivery. For sale or rent.
1—Plymouth 30 ton, gasoline, standard gauge, Locomotive, air brakes, etc.

MOBILOADER

1—Caterpillar D-8 Mobiloader, 2¼ yd. scoop.

SHOVELS & DRAGLINES

1—Marion 4 yd. Electric, model 4160, full revolving, crawler tread, Ward Leonard control equipment, late type crawlers; perfect condition.
1—Marion 482, electric, 3½ yd. capacity, Ward Leonard control equipment.
1—Marion model 392, 2½ yd. capacity, diesel powered.
1—Northwest Shovel, model 80, 2 yd. capacity, gasoline.
1—Link Belt 45 combination Shovel and Dragline, 1½ yd. capacity, diesel powered.
1—Link Belt K-55, 2 yd. Dragline, diesel powered.

TRUCKS

4—Euclid 11FD, end dump, 15 tons capacity, 200 H.P. Cummins supercharged, diesel motors; guaranteed condition.

LOG TYPE STONE or ORE WASHER

1—Allis Chalmers 25 ft., heavy duty, Hutch type, Log Washer, with steel tank, ⅜" plate, with 2 logs, with 35" dia. manganese paddles. Located Minnesota.

JAW CRUSHERS, GYRATORY CRUSHERS, ROLL CRUSHERS, DRYERS & KILNS, HOISTS, CARS, CRANES, SHOVELS, ETC.

WE WILL BUY ANY MODERN PIECE OF EQUIPMENT ANYWHERE.

A. J. O'NEILL

Lansdowne Theatre Building, Lansdowne, Pa.
Phila. Phone: Madison 8300

PIPE New & Reconditioned
ALL SIZES for ALL PURPOSES
Cut and Threaded to Your Specifications
VALVES AND FITTINGS
UNITED PIPE & SUPPLY CO., NORRISTOWN, PA.

FOR IMMEDIATE SHIPMENT

RAYMOND PULVERIZERS

2—4 roll HIGH SIDE MILLS COMPLETE, FOR EXTREMELY FINE PRODUCTS.
1—4 roll HIGH SIDE MILL, EQUIPPED WITH WHIZZER SEPARATOR AND LATEST OIL TYPE JOURNALS.

BELT CONVEYORS

1—30"x640' c/c, complete, ball bearing idlers, gear reducer, 30 H.P. motor, etc.
1—30"x120' Rex-Stearns, ball bearing idlers, complete but without belt.

OLIVER CONTINUOUS FILTERS

1—8'x8' rebuilt, with new wood staves, wood grids and new internal piping.
2—8'x10' with wood staves, steel trough.
2—8'x12' all steel, complete with pumps and receivers.

SYMONS CONE CRUSHER

1—3 ft. with coarse bowl, spare parts.

HARDINGE CONICAL BALL AND PEBBLE MILLS

1—5'x22", iron lined, silent chain drive
1—6'x36", silex lined, silent chain drive and motor.
2—8'x30", silex lined, belt driven.

CRUSHING ROLLS

1—24"x40" Pennsylvania Single Roll Crusher, flat belt drive.
2—40" dia. x 16" Colorado Iron Works, smooth rolls, equipped with fleeting device.

DORR CLASSIFIERS AND THICKENERS

3—Dorr Combination Bowl and Rake Classifiers;
10' dia. with 2'3" x 19'8" rake
12' dia. with 2'3" x 21'4" rake
15' dia. with 2'3" x 23' rake

DIRECT HEAT ROTARY DRYERS

2—4'x30' Ruggles-Coles single shell. Can also be used as Rotary Kilns.
2—5'x40'
1—6'x24' Cummer, mounted on steel I-beam frame, with furnace, etc.
2—6'x30' Ruggles-Coles, double shell.

FOR 25 YEARS A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.
17-19 PARK ROW NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

FOR SALE

REASONABLY PRICED - COMPLETELY EQUIPPED

LOCATION: **UTICA, ILLINOIS.**

PROPERTY OF:

THE UTICA HYDRAULIC CEMENT COMPANY.

TRANSPORTATION: **MAIN LINE OF THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY CO. FEDERAL GREAT LAKES TO GULF WATERWAY.**

PRODUCING: **FIVE GRADES OF NATURAL OR HYDRAULIC CEMENT.**

CAN ALSO PRODUCE: **AGRICULTURAL LIMESTONE—STONE AGGREGATE AND ROCK WOOL.**

INQUIRE OF: **CHAS. J. NIESEN—402 CENTRAL LIFE BLDG., OTTAWA, ILLINOIS.**

FREIGHT CAR PRICES REDUCED

Now only half of recent peak prices
$500.00 to $1950.00

Which of these cars could YOU use?

55, Hopper, Double, 50-Ton
10, Hopper Side-Discharge, 50-Ton
100, Refrigerator, 40-Ft., 40-Ton
16, Refrigerator, 36-Ft., 30-Ton
14, Ballast, Composite, 50-Ton
25, Box, 36-Ft., 40-Ton
18, Dump, K & J Automatic, 16-Yd., 40-Ton
6, Dump, K & J Automatic, 30-Yd., 50-Ton
1, Dump, Koppel, Automatic, 20-Yd., 40-Ton, Drop-side Door
4, Dump, Western, 20-Yd., 40 & 50-Ton
20, Flat, 40-Ft., 40 & 50-Ton
33, Gondola, Composite, 36-Ft., & 40-Ft., 40-Ton
9, Gondola Steel, 50-Ton, High-Side
30, Tank, 8000-Gallon, 40 & 50-Ton

All cars are priced to sell!

IRON & STEEL PRODUCTS, INC.
39 years' experience
13490 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

FOR SALE

160 HP Winton Diesel with 100 KW Crocker Wheeler Generator

Blount Floor Type Bit Grinder
Cleveland Wagon Drill
4—Gardner-Denver Drifter Drills
2—Worthington Drifter Drills
24x24 Jeffrey Single Roll Coal Crusher
Fuller-Kinyon Electric Handling Outfit with Power Take-up and Compressor—3 phase 60 cycle
13x24 Acme Crusher
No. 5 Midwest Hammer Mill

• • •

THE W. T. WALSH EQUIPMENT COMPANY
3088 West 106 Street
Cleveland 11, Ohio Orchard 4400

200 HP Cummins Supercharged Diesel Engine.
120 HP Anderson 480 Volt Diesel Gen. Set.
125 HP Venn Severin Diesel, Factory Rebuilt.
16" x 24' Jeffrey Port Conveyor, Gas Drive.
No O Cedar Rapids Kubit Impact Breaker.
Traylor 36" Type TZ Gyratory Crusher.
Williams 4 roller Mill, complete.
Hardinge 16" x 6' Conical Ball Mill, steel balls.
21 x 42" McLanahan Single Roll Crusher
Barber Green Model 42 Gas Crawler Loader.
4 Jeffrey Traylor 36 x 36" Elec. Pan Feeders.
Two Waukesha Nat Gas Engines 42 & 57, 6 HP.
50 HP Nat'l Drag Scraper Outfit. Gas drive.
2 yard Page Walker Dragline 60' boom, Diesel
Louisville Dryer 54" dia. x 40' long Monel Lined.
Belt & Bucket Elevator 60' Centers Bkts. 11½x7".
17 x 36" Pioneer Roller Bearing Jaw Crusher.
20 x 20" Diamond double smooth roll Crusher

MID-CONTINENT EQUIPMENT CO.
710 Eastgate, St. Louis 5, Mo.

1 ¼ yd. Lorain Crane, 45 ft. boom 1¼ yd. Shovel Att.—Pull shovel Att.
1¼ Yd. Byers Gas Shovel.
1 Yd. B-Erie Gas-Air Shovel.
20 KW and 30 KW. Int. & Cat. diesel electric sets.
1 Yd. Link Belt K-30 gas shovel.
14 ton Whitcomb Loco-Gas—36 Ga.
20 ton Plymouth Loco-Gas—Std. Ga.
27—E. Smith Paver, Model H-31.
5—Electric Hoists, 40, 50 and 60 HP.
1 Yd. Round Shaft Buckets.
1 Yd. and ½ Yd. Dump Buckets.
2—Shovel Attach. for Byers Bearcat, Jr.
Shovel Attachment for 41B Bucyrus-Erie.

J. T. WALSH
Brisbane Building Buffalo 3, N. Y.

FOR SALE

Two Besser Super K Tampers
Two 40 Cu. Ft. mixers
6000 Steel Pallets
10x16—4 Roll New Holland Crusher
Vibrating Screens
Rail—block cars and transfer

MULTIPLEX CONCRETE CO. INC.
East Orange, N. J.

EQUIPMENT FOR SALE

3—Duplicate **VULCAN** 21 ton, 36" Ga. steam saddle tank locomotives, Cy. 11"x16"—Nat'l Board boilers. blt. 1923
1—45 ton **BALDWIN** 2-6-2 Prairie type, std. ga. loco. & tender.
1—56 ton **BALDWIN** 0-6-0 std. ga. switcher type with separate tender. 19"x24" cy.
10—36" ga. **WESTERN** 5 yd. dump cars.
10—Std. ga. **WESTERN** 12 yard dump cars, all steel, hand dumps.
1—**BROWNING** No. 3 steam loco. crane, 30 ton capacity, 60' boom.
2—Model 25A **KALAMAZOO** motor section cars, 4 cy. gasoline motor.
3—Model 119-L **BUDA** motor section cars, Buda air cooled motor.
1—**BLAW-KNOX** 1½ yd. clam shell.

Send us your inquiries for rebuilt equipment.

SOUTHERN IRON & EQUIPMENT CO.
Plant & Gen. Offices
Atlanta 2, Ga.

NEED HELP, EQUIPMENT, A COMPLETE USED PLANT?

Thousands of equipment items and services are offered each month in the Broadcast Section of Pit and Quarry. You can probably find just what you are looking for by reading the ads carefully. But, should you fail, a small "wanted" advertisement costing as little as $6 may do the trick. Bring the problem to us . . . write the ad yourself or tell us in your own way what you are seeking, and we'll prepare the copy for you.

PIT AND QUARRY
Broadcast Section

75—Used Steel-Brooks Load Lugger Buckets; 1½ yds. capacity. V shaped bottoms —rounded, with ring hooks.

• • •

CLINE & DOOCHIN
707 19th Ave. North
Nashville 4, Tenn.

Jaw Crushers—4"x8" up to 18"x36".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3, No. 12.
Ring Roll Mills—No. 0, No. 1, and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—Nos. 0, 1, 1½ and 2.
Direct Heat Rotary Dryers—3½'x25', 4'x30', 5½'x40', 6'x50', 7'x50'.
Semi-indirect heat Dryers—70"x35'.
Cement Kilns—3' up to 8' diameter.
Hardinge, Marcy & Fuller-Lehigh Mills.
Raymond Mills—Nos. 00, 0, 1, 2 Roll.
Tube—Rod and Ball Mills—3' to 6' diameter.
Vibrating Screens—Air Separators.
2 heavy, C. I. pulleys, 84" x 23".
New Dryers built for all purposes.

W. P. HEINEKEN
277 Fulton St., N. Y. Tel. Barclay 7-7298

For Sale: 100 Tons New ¼ In.

Armor PLATE

Write for Prices & Sizes

Box 1125, Pit & Quarry
538 So. Clark Chicago 5, Ill.

CLAMSHELL BUCKET

1—5 yd. Kiesler bucket, Style N, digging or rehandling. NEW 1943. Wt. 11,500 lbs.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

CRANES AND SHOVELS

1—1¼ yd. Erie gas air Model GA2, Serial No. 9758, with 45' boom and shovel attachment.
1—1 yd. Marion, indl. 440, Seo. No. 5961, 50' boom.
1—1 yd. Mdl. 600 P. & H., Serial No. 3502, 40' boom and backhoe attachment.
1—¾ yd. Conco crane. Ser. No. 1304, fully revolving, power 70 H.P. Continental gas engine, 30' boom.
1—¾ yd. P. & H. Model 400 crawler crane, Serial No. 4136, with 40' boom, gasoline powered.
1—½ yd. P. & H. shovel, Model No. 204, Serial No. 2303, gasoline powered.
1—¾ yd. Erie Model B2 crawler crane, steam powered. Serial No. 4027, with 50' boom and shovel attachment.

CONVEYORS

1—100' Stationary troughing type belt conveyor, 16" wide.
1—30' Link Belt troughing type portable, 18" wide.
1—25' Northern troughing type portable, 18" wide, with elect. or gas power.

An employer who buys "main strength and awkwardness" is a loser. The modern, profitable way is to see that employees have the *most suitable equipment* to do the job the easy way. Get it from E.C.A.

ELECTRIC CRANE

1—18 ton O. & S. Type B CRANE, mtd. on 8' 0" ga. track, 50' boom. Power 52 H.P., 440/60/3 elect. mtr.

CRUSHERS

1—9x12" Rogers jaw crusher (Like New).
1—No. 4 Champion jaw crusher, size 9x15", Serial No. 2606.
1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—9x12" Rogers jaw crusher, No. 314. LIKE NEW.
1—10x12" Colorado Iron Works roll crusher, Laboratory type.
1—Allis Chalmers No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS

3—Steel Guy Derricks: 1—20 ton American, steel derrick, 110' mast, 100' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom. 1—5 ton Insley, 75' mast, 80' boom. Stiff leg derricks: 1—25 ton Hunter, 40' mast, 80' boom. 1—2 ton Pittsburgh, 26' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5 ton cap.

HOISTS (Elec., Gas, Steam)

85—Electric, ranging from 20 H.P. up to 125 H.P., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.
Gas hoists ranging from 8 to 120 H.P., single, double and triple-drums; all standard makes (38 in stock).
Steam, ranging from 8 H.P. to 60 H.P., single, double and triple-drum; all standard makes.

PARTIAL LIST ONLY — SEND FOR 48 PAGE STOCK LIST

All this equipment is owned by us and may be inspected at one of our plants. WE BUY—REBUILD, SELL AND RENT.

—CHICAGO 12, ILL.—
1160 S. Washtenaw Ave.
PITTSBURGH 30, PA.
P. O. Box 933
Dept. PQ

—PHILADELPHIA 2, PA.
1513 Race St.
NEW YORK 7, N. Y.
30 Church St.
Dept. PQ

EQUIPMENT CORPORATION of AMERICA

FOR SALE

DIESEL ENGINE — Fairbanks-Morse, stationary type, Model 32E12, 12"x15", three-cylinder, 180 HP, 360 RPM. Sold new 1942—used only 1500 hours. This is the same as a new engine. Price, guaranteed, f.o.b. Louisville.....$8200.00

DIESEL ENGINE—"Caterpillar" power unit, Model d6100, complete on skids with clutch; rebuilt and guaranteed $1705.00

GASOLINE ENGINE—Wisconsin, Model D2, six-cylinder, 105 HP power unit on skids with clutch, etc.; rebuilt and guaranteed.....$1820.00

GASOLINE ENGINE — Continental Model E613 — six-cylinder 4¼ x 4½, 75 HP rebuilt and guaranteed $795.00

ROCK CRUSHER with GRISSLY FEEDER — Pioneer 24" x 36", roller bearing, feeder 40" x 10', new 1942, used very little, A-1; guaranteed..... .....$10,850.00

ROCK CRUSHER—jaw type, roller bearing, Good Roads, late model, nearly new, 10" x 40"....$3825.00

ROCK CRUSHER—jaw type, roller bearing, Good Roads, late model, 10" x 20"; rebuilt and guaranteed $1750.00

AIR COMPRESSOR—stationary, belt driven, Gardner-Denver, 12 x 12, 420 cft. displacement, complete with large tank.....$800.00

ROY-C-WHAYNE SUPPLY COMPANY
Main Street, Louisville 2, Kentucky

FOR SALE

Austin Gyratory Crusher No. 107.
Buchanan Crusher, 12" x 36" Type B Jaw Crusher.
Allis-Chalmers Double Roll Crusher, Garfield Type, Size 54" x 20", with new Manganese Roll Shells.
Lippman Scrubber Screen, 72" x 18', Complete with G.E. 20 HP Motor, 440 volt, with starter.
Tyler Type 31 Tandem Hummer Screen 8' x 5', 3 surface with G.E. Type G2 Motor Generator Set.

Address inquiries to:

AMERICAN ZINC COMPANY OF TENNESSEE
Paul Brown Building, St. Louis 1, Missouri

FOR SALE

1—16 x 16 Cedar Rapids Roll Crusher complete.
1—20 HP Electric Motor. One starting Switch and belt for same.
1—Belt Bucket Conveyor 18 feet long.
Ready for use.

SHELBYVILLE GRAVEL COMPANY
SHELBYVILLE, INDIANA

50x24 Champion Jaw Crusher
36x24 Farrel Jaw Crusher
36x18 Farrel Jaw Crusher
36x15 Universal Overhead Eccentric Jaw Crusher
18x9 Climax Jaw Crusher
16x8 Climax Jaw Crusher
24x12 Champion Jaw Crusher
#13A Telsmith Primary Gyratory Crusher
#38 Kennedy Reduction Crusher with 75 HP Synchronous Motor built in flywheel
3-Brand new Worm Washers, 14' long, 30' diameter
10'x5' Niagara single deck Vibrator
12'x4' Telsmith double deck Vibrator
12'x3' Symons double deck Vibrator
8'x3' Symons double deck Vibrator
25'x5' Traylor heavy duty Revolving
18'x4' Telsmith Ajax Revolving
Double drum Novo Hoist with 4 cylinder Novo gasoline engine directly connected on heavy cast iron base
Barnes Triplex high pressure pump directly connected to 4 cylinder Hercules Model O gasoline engine on steel wheels
Model 82 Barber Greene Bucket Loader on caterpilar with 4 cylinder Buda Engine with self starter
1—1¾ yd. shovel bucket, manganese heavy duty
1—1¼ yd. Clamshell material handling Bucket

FRANK A. KREMSER & SONS, INC.,
R. D. No. 2, Reading, Pa.
Phone: Leesport 100
Night Phone: Philadelphia: HANcock 7959

Conveyor, 70' belt practically new, 24", sectional. $600.00.
Universal Jaw Crusher, 15" x 36", good as new, only been used three months. $2500.00.
Diamond Portable Crushing plant, 15" x 36", with folding type elevator, screen, Cummins Diesel Engine. Used on 20,000 tons—like new. $5000.00.
Brooks Load Luggers, latest model CH-200, 2 yd. buckets. Practically new. $750.00.
Link-Belt Speeder, combination shovel-dragline ¾ yd. $6000.00.
N. Wenzel, 2136 Jefferson Street, Kansas City, Mo.

1—18' x 42" single roll McLanahan crusher with 21" x 42" roll. A-1 shape. Extra set of segments.
1—30' bucket elevator, good shape. New chain.
1—7" x 12" Universal jaw crusher. New pitman shaft & bearings.

Box 1015 Pit & Quarry Publications
538 South Clark Street Chicago 5, Illinois

One Iron Fireman PS No. 6, Serial CA-21156 pneumatic stoker in excellent operating condition, complete with switchboard and spare parts. Reply to:

•

Box 1115, care PIT AND QUARRY
538 South Clark Street, Chicago 5, Illinois

FOR SALE

One new Caldwell wood Circular Tank 12 ft. in diameter—15 ft. high can be used for cement or aggregate storage.

• •

THE MCENERY COMPANY
1302 Myrtle Street, Erie, Pa.

FOR SALE

½ yd. Thew Electric Shovel Model 00 recently overhauled—good condition—$4250.00.
Can furnish 30' Crane boom.
For further information or inspection call

H. J. Mosher
Telephones: Sunnyside 7257 or Longbeach 7134
5301 N. Kenmore, Chicago, Illinois

WANTED:

1—⅜ to ½ yd. Truck crane, shovel attachment; pneumatic tire.
1—½ yd. cat. mounted shovel, electric power preferred; gas or Diesel accepted.
1—350 HP slip ring motor, 400 RPM, 3/60/440 volt, Base, no pulley. If magnetic clutch available can use synchronous.
3—15 ton pneumatic trucks equipped with Easton side dump bodies. All items modern.

R. E. BOGGS
1427 South Eighteenth Street, Birmingham, Alabama

WANTED

To purchase a 1½ yard, 60 to 70 ft. boom, Bucyrus Monighan Diesel driven Dragline. Machine must be in good condition.

•

Box 1130
PIT AND QUARRY
536 S. Clark St. Chicago 5, Ill.

WANTED TO BUY

1½ yd. dipper for 50 B. Bucyrus Diesel Shovel suitable for digging stone, also new or used shovel parts for above.

• •

BOX 1105 C/O PIT & QUARRY
538 So. Clark Street, Chicago 5, Ill.

WANT TO BUY

2 Gunite Machines.
2—1¼ or 1½ Yd. Elec. Shovels.
1—1,000 to 15,000 Ft. Air Compressor.
1 Ton or 2 Ton Asphalt Plant.
2—12,000 to 18,000 Gal. Tanks.

THE DARIEN CORPORATION
DARIEN CONN.

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

V. M. NUSSBAUM & CO., Fort Wayne, Ind.

WANTED

1—24 x 36 Farrell Crusher & Feeder for same.
1— 4 x 12 Three Deck Vibrating Screen.

SUBURBAN CONSTRUCTION CO.
Box 511, Ardmore, Pa.

WANTED

Twin City Motor Gasoline Model C-4 cylinder-counter clockwise rotation—6¼" x 8"—for use in Crane.

P. O. Box 155, Shelbyville, Indiana

FOR SALE

PAGE DIESEL DRAGLINE, 2 cu. yd. Class 411 in good condition.

WANTED

130 h.p. DIESEL MOTOR.
100 KVA DIESEL GENERATING UNIT.

C. D. SMELSER CONSTRUCTION COMPANY
511 W. COLFAX AVE., SOUTH BEND, INDIANA

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. Lee Heidenreich, Jr.

Consulting Engineer

Route No. 1, Newburgh, N. Y.
Phone 3677-M

Operation
Plant Layout
Design
Construction
Appraisals

POSITION WANTED

College Graduate with C. E. and M. E. degree with fourteen years as Construction Supt. and Production Manager quarry operation, Ready Mix Concrete plant, Building Material, Construction Supt. or Project Manager.
Age 44, married. Settled Salary open. Draft status clear 4A.

Reply Box 1135, c/o Pit & Quarry
538 S. Clark St. Chicago 5, Ill.

SITUATION WANTED

Asphalt Paving Supt.—35 years experience street and road construction, can operate and build dryers, mixers, melting kettles or complete plant large or small. Wants job with paving contractor, or manufacturer contemplating or building asphalt paving equipment.

Box 1145
PIT AND QUARRY
538 S. Clark St. Chicago, Ill.

WANTED
CONCRETE PIPE PLANT SUPERINTENDENT

Excellent opportunities for the right man. Plant located in fast growing section of Texas Coast. Must be able to assume complete responsibility. In first letter give complete information concerning yourself, past experience and salary expected. **Write Box 925, c/o Pit and Quarry, 538 South Clark Street, Chicago 5, Illinois.**

WANTED

Quarry Supt. and Asst. Supt. for established midwest plants — operating year around.

Reply Box 1030, Pit and Quarry Publications
538 South Clark Street, Chicago 5, Illinois

WANTED

Plant Engineer and Asst. Supt. for Cement Plant in West. Give age, positions held, family status, salary expected, etc. This is a permanent position with possibilities for promotion.

Write Box 955 c/o Pit and Quarry, 538 S. Clark St., Chicago 5

Royal E. Burnham

Attorney at Law

Patent and Trade-Mark Causes

511 Eleventh Street, N. W.
WASHINGTON, D. C.

CORE DRILLING TEST BORING

Dundee Engineering Company
Dundee, Illinois

CORE DRILLING
ANYWHERE
We look into the earth
PENNSYLVANIA
DRILLING COMPANY
PITTSBURGH, PA.

WANTED

1 yd. or 1½ yd. gas or diesel
CRANES, DRAGLINES & SHOVELS

Hawkins & Company
124 So. Michigan Ave. Chicago, Ill.

WANTED

SUPERINTENDENT
PLASTER MILL AND QUARRY

Location in Western Section of United States.

In applying give education, positions held with length of service, marital status, citizenship and age.

Salary earned last position, salary expected, and how soon available.

Write Box 935, Pit & Quarry Publications, 538 South Clark Street, Chicago 5, Illinois.

SITUATIONS WANTED

Married man, 38 yrs, of age. No college degree, but is qualified for position of Supt. or Asst. Supt., by 18 yrs. practical experience in all departments of both wet and dry cement plants. Prefer West Coast.

Reply Box 1140, Pit and Quarry Publications, 538 South Clark Street, Chicago 5, Illinois.

Chemist — Cement

Chief Chemist—Cement plant South America—knowledge of Spanish not necessary but advantageous. Good salary. Prefer single, under 50 yrs. **P. O. Box 286, Church Street Annex, N. Y. C.**

2—No. 200 Rex double pumpcretes, excellent condition, with Waukesha 6-cylinder gas engines complete with pugmill remixers and 1,200 ft. 8" pipe.

2—30B Diesel driven caterpillar cranes with dragline and shovel attachments.

1—No. 480 Marion steam crawler crane without attachments.

1—Complete I-R No. 54 drill steel sharpener with one 27F oil furnace, one JF furnace, one shank and bit punch, cut-off machine, etc., etc., in guaranteed condition.

1—5 Cubic yard Owen clamshell bucket—weight 27,000 lbs.

GREAT LAKES DREDGE & DOCK CO.
122 So. Michigan Ave., Chicago 3, Ill.

RAILS NEW AND RELAYING

MOST ALL SECTIONS IN STOCK also spikes, bolts, frogs, and switches available.
Always in the Market to buy surplus material. Send us your inventories.

M. K. FRANK
480 Lexington Ave., New York City — Park Building, Pittsburgh, Penna.
Blitz Bldg., Reno, Nevada — Havana, Cuba

FOR SALE

Cleveland baby trenchers wheel type.
Buckeye model 12 & 36 wheel type trenchers.
Barber Green trenchers.
Caterpillar D-2, D-4 highlifts.
Caterpillar RD-6 angledozer.
Northwest model 20 crane.
5 & 10 Buffalo Springfield roller.

AIR COMPRESSORS RENTAL CO.
2324 East 105th Street, CLEVELAND, OHIO

One No. 33 Ingersoll-Rand Leyner Jacksteel Drill Sharpener. Serial No. 2842 taken out of service and replaced with a larger machine, in good operating condition. Reply to:

•

Box 1110, care PIT AND QUARRY
538 South Clark Street, Chicago 5, Illinois

FOR SALE

One Besser Super K3 Tamper 6½ Blocks Per Minute, like new, 3500 Steel Palletts, 100 Racks Holding 64 Blocks 8 x 16 each; also one Power Hoist off Bearer Blocks and one Clark Lift Truck Purchased 1941. Used very little.

LEHIGH BUILDING BLOCK COMPANY
Phone 27606—1019 North Quebec St., Allentown, Pa.

LOCOMOTIVE CRANES
8-wheel, steam

15 ton Brownhoist, 50' boom.
20 ton Industrial, 50' boom.
25 ton Browning, 50' boom.
30-40 ton Brownhoist, 50' boom.
35 ton McMyler, Type "J" 50' boom.

IRON & STEEL PRODUCTS, INC.
13490 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

FOR SALE

1—No. 4 Austin Gyratory Crusher, corrugated head. Good condition.

1—No. 3 Austin Gyratory Crusher, smooth head. New concaves for No. 3 crusher. Will sell cheap.

NORTHWOOD STONE COMPANY
R. F. D. No. 2
Bellefontaine, Ohio

GOOD VALUES—ALWAYS

24x18" and 36x18" American Hammermills.
35 Ton Plymouth WLG Gaso. Locomotive.
80 HP to 550 HP Diesel Engines.
20 Ton American Steel Guy Derrick.
35 HP Clyde 2 drum swinger Gas Hoist.
1 Yd. P&H 600A gas crane and dragline.
1¾ yd. Marion 372 Diesel Shovel, Crane, Dragline.
80, 150, 250 HP HRT Steam Boilers.

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust St. — St. Louis 1, Mo.

FOR SALE

Large quantities of new Link Belt and Jeffrey chain in following sizes are available from our stock for immediate shipment: #88—#83—#85—#C102.
Also large assortment of sprockets.

• • •

Lancaster Engineering Corp., Mountville, Pa.

FOR IMMEDIATE DELIVERY OF RUBBER PRODUCTS

Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	9"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.
62-66 PARK PLACE — NEW YORK, N. Y.

SOUTHERN AGGREGATES CORPORATION
RALEIGH, N. C.
Equipment For Sale

I-R Compressor, Type XB-2, 16" & 10" x 14", Serial #18180/1 with Coppus FC-6 filter.
2 100 H.P. **Allis-Chalmers** 2200 volt, 3 phase, 60 cycle, slip ring motors, 700 and 865 R.P.M., with drum controllers, grids and circuit breakers.
8 2-cu. yd. **Koppel** industrial cars, 24" gauge, roller bearings.
11 36-cu. ft. **Koppel** industrial cars, 24" gauge, rollers bearings.
2 **Austin** model 105 crushers.
1 **Allis-Chalmers** Gates 5-K crusher.

DIESEL GENERATORS

1—Diesel Generator Set, 300 HP., Fairbanks-Morse Diesel, 6 cylinder, Model 32, complete with auxiliaries, 257 RPM., direct connected to a 250 KVA Fairbanks-Morse Generator.

AIR COMPRESSORS

1—Ingersoll-Rand Duplex Air Compressor, Type XB, 582 cu. ft. motor driven.
1—Ingersoll-Rand Imperial, Type XB-2, Duplex Air Compressor, 12"x7½"x12".

COOLERS AND DRYERS

1—7x56 ft.
1—10x90 ft. And Others.

CRANES AND SHOVELS

1—P & H 1-yd. Shovel, Gasoline, Reconditioned.
1—Locomotive, 4-wheel, 10-ton, 25' boom, Brown Hoist Co.
1—Overhead, 10-ton, 7'6" span, air operated.

CRUSHERS

2—No. 5 Gates Gyratory Crushers, Style D. Others—various types and sizes.

CEMENT KILN GUNS

2—Remington Arms Cement Kiln Guns.

HOISTS

1—S. Flory Mfg. Co. single drum Hoist. Handles 11 ton car up 12% grade 500 ft. per min.

KILNS

1—8x9½x180 ft.
And others.

LOCOMOTIVE AND CARS

1—4-ton Vulcan Iron Works, Class AW-4, Worm Gear Gasoline Locomotive, 36" gauge.
6—5-yd. Koppel 2-way Dump Cars, 36" gauge.

HAMMER MILLS

2—Ajax Hammermills, size SXT-11 (1-R.H., 1-L.H.). Handles stone 300 tons per hr. 8" to 1½" each. Also spare parts.
1—Williams No. 6 Hammermill.

DRILLING EQUIPMENT

1—No. 40 Ingersoll-Rand Drill Sharpener and Accessories.
1—No. 33 Ingersoll-Rand Leyner Drill Sharpener.
1—Improved Type No. 22 electric power Loomis Machine Company Clipper Drill, complete with motor.
2—Ingersoll-Rand DCR No. 430 Drills.
2—Denver-Gardner Company (Turbo-Waugh) No. 37 Drills.
4—Denver-Gardner Company (Denver-Waugh) No. 95 Drills.

FEEDERS

2—Bailey Pulverized Coal Feeders, Type No. 2, complete with steel hoppers, 8½" ft. dia. x 12 ft. cone bottom.

GRINDING EQUIPMENT

2—5½'x22' Allis-Chalmers Compeb Mills.
3—5½'x20' F. L. Smidth Tube Mills. Silex Lined.
1—5'x22' Tube Mill.
1—5'x10' Tube or Ball Mill.
1—4-roll Raymond Mill.
3—Giant Griffin Mills.

ELECTRIC MOTORS AND MG SETS

Large stock, rebuilt, AC or DC. 25 and 60 cycle.

SYNCHRONOUS MOTORS

1—1900 HP., 25 cycle, 2300 V., 150 RPM.
2—1250 HP., 25 cycle, 2300 V., 150 RPM.

ROAD ROLLER

1—Austin-Western "Autocrat" 10-ton with compressed Air Scarifier. New 1941. Gasoline.

AIR SEPARATOR

1—14 ft. Sturtevant Air Separator. New 1941.

MAGNETIC SEPARATORS

3—Stearns High-Duty Magnetic Separators, 24" dia., 48" face. New 1939 and 1940.

TRACK SCALE

1—Homestead (Carnegie-Illinois Steel) Standard Track Scale, 46'-100 ton capacity. Complete.

TANKS

1—6700 bbl. capacity Oil Storage Tank.
Others up to 55,000 bbls.

TURBINE

1—100 HP Westinghouse Turbine, 2700 RPM, direct connected to 100 HP, Westinghouse Gear Reducer. Ratio 3 to 1.

WEBBER EQUIPMENT CO.
17 East 45th St. MU. 2-6511
NEW YORK 17, N. Y.

FOR SALE

1—30 Ton Diesel Powered Standard Gauge Locomotive, 4 speeds forward and reverse. Standard couplers, Westinghouse Air Brakes and Worthington Air Compressor Model A-23. Manufacturer's rating: First gear 2½ MPH with drawbar pull of 15,000 lbs. Powered with Murphy Diesel Engine, 6 cylinder, water cooled.

1—50 Ton Baldwin Standard Gauge Coal Burning Locomotive, weight approximately 95,000 lbs. on Drive Wheels, Traction Force 21,500 lbs. Drive Wheels 50" diameter, wheel base 9'9". Boiler A.S.M.E. Maximum safe working pressure 180 lbs., 161 tubes 13'1" long x 2" dia., with safety valves. Tender capacity 6 tons coal, 4500 U. S. gal. water.

1—10 Ton Diesel Powered Standard Gauge Davenport Switching Locomotive, 4 speeds forward or reverse, closed type cab, Westinghouse Air Brake system, 4—24" side rod connected drivers. Manufacturer's rating 5,000 lbs. T. E. at 2.6 MPH, 2300 lbs. T. E. at 13 MPH. Powered with a Model D-8800 Caterpillar Diesel Engine, 4 cylinder, 5¾" x 8" with 2 Cylinder gasoline starting engine, 4 speed, Davenport, main transmission. Equipped with ARA Type Couplers, Westinghouse Type K-14-13 Air Brakes, Gardner Denver Air Compressor.

14—10 Ton Goodman 36" Gauge Storage Battery Mining Locomotives, 1939, 54" wheelbase, class "A" chassis. Mechanical brakes hand wheel control.

4—4 Ton Goodman 36" Gauge Storage Battery Mining Locomotives, 1938.

1—3 yd. Marion Electric Shovel, Ward Leonard Controls, Westinghouse M. G. Sets, 34' Shovel Boom, 23' Dipper Stick, 1940.

2—2½ yd. Marion Electric Shovels, Ward Leonard Controls, 31' Shovel Booms, 21' Dipper Sticks, with Dragline Attachment, 70' Lattice Boom.

2—2½ yd. Bucyrus Erie Model 75B Electric Shovels, Ward Leonard Controls, 29' Shovel Booms, 20' Dipper Sticks, with Dragline Attachment.

BOX 35, NEW ROCHELLE, NEW YORK
NEW ROCHELLE 2-7680

FOR SALE

Four Unmounted Truck Mixers
2½ cubic yard Horizontal
Good operating condition.
No reasonable offer refused.

J. A. NICHOLSON

Toledo, Ohio **Phone Garfield 7137**

1—Buda Power Unit, 50 H.P., Model YRA
1—Cummins Diesel Power Unit, 85 H.P., Model HIP
1—Simplicity 3' x 8' three (3) deck Vibrating Screen
1—Single Drum Hoist, 35 H.P., Waukesha Engine
1—1500 Watt Kohler Portable Gasoline Lighting Plant
1—⅝ cu. yd. Blaw-Knox Clamshell Bucket
2—¾ cu. yd. Owen Type K, Clamshell Buckets
2—1 cu. yd. Owen Type K Clamshell buckets
2—9" x 16" Cedarapids Jaw Crushers
1—8" x 24" Universal Crusher, portable and bucket conveyor
1—10" x 20" Allis Chalmers Blake Type Jaw Crusher
2—10 ton Huber 3 wheel gas rollers
1—7S Yeager, single axle, pneumatic tires, 4 cyl. engine
1—5S Rex Mixer, Single angle, pneumatic tires, Wisconsin engine
1—Shovel front for 10-B Bucyrus-Erie
1—Schramm Fordair 60 Compressor
1—Ingersoll-Rand 160 Compressor, 2 stage, Waukesha engine, 4 pneumatic tires

• • •

YATES MACHINE WORKS
Rochester 1, Michigan

FOR SALE

2 bag mixer for a block plant, 18 to 24 cu. ft.

FRED RADANDT SONS
R3 **Manitowoc, Wisconsin**

FOR SALE

Two revolving discs and gears for Barber-Greene Disc Type Loader.

BURTSCHI MOTOR COMPANY
VANDALIA, ILLINOIS

FOR SALE
Two 2½ Cubic Yd. YEAGER MIXERS Model 1940 Mounted on Model 345 White Trucks $2000.00 Each.
One Full Revolving Truck Crane Mounted on 3 Ton Truck & Solid Tires.
Loads & Radius of Boom
4500 Lbs. at 20 Ft. Radius
5565 Lbs. at 17 Ft. Radius
7837 Lbs. at 13 Ft. Radius
Price $2400.00
HERBERTSON SAND & GRAVEL COMPANY
75 Raritan St., DENVER 9, COLORADO

SHOVELS — DRAGLINES

2 — 120B Bucyrus Erie elec. 80 ft. Dragline Boom, 5 yd., Bucket & 32 ft. Shovel Boom 4¾ yd. Bucket.
2—2½ yd. 48B Bucyrus Erie Diesel Shovels & 60 ft. Boom Draglines.

36 IN. CONVEYOR EQUIPMENT

800 Anti Friction Troughing Idlers.
300 Anti Friction Return Idlers.
1500 Ft. 6 ply Conveyor Belt.

R. C. STANHOPE, INC.
60 East 42nd St., New York 17, N. Y.

⅜ yd. Bucyrus Drag-Line Bucket Shop Overhauled.
1st class working condition.

O & H GRAVEL CONSTRUCTION COMPANY
PLYMOUTH, INDIANA

4 Yd. Elec. Cat. Shovel. Misc. others.
1½ yd. Gas Cat. Shovel, new 1931.
1¼ yd. Gas Shovel—Crane—Dragline.
1¼ yd. Northwest Gas Dragline—Crane.
TD-40 Bullgrader; Trenchers—44-C & B.
Pulverizers—No. 4 & No. 4 Jr., Jef. 24x30.
Haiss Loader; 60"x40' Sand Drag.
75 HP 3 drum Electric Hoist, 3-60-440.
10 yd. 200 HP Diesel Trucks, rear dump.
220' actual Gas Port. Compressor. Barg.
James Wood, 53 West Jackson Blvd., Chicago 4, Ill.

QUARRY EQUIPMENT

• • •

1—4 ft. Symons Cone Crusher
1—15x38 Telesmith Jaw Crusher
1—4 cyl. 110 HP Atlas Diesel Engine
1—Robbins Vibrating Screen
1—Barber Green Rock Feeder

• • •

FOR SALE OR FOR RENT

• • •

KEN ROYCE CO. **SAN FRANCISCO**
185 Bayshore Boulevard

LOCOMOTIVES

1—20 ton Plymouth standard gauge gasoline
1—20 ton Whitcomb diesel 36" gauge
1—57 ton Baldwin type 0-6-0 standard gauge saddle tank
2—67 ton American type 0-6-0 standard gauge separate tenders
2—78 ton Baldwin type 0-6-0 standard gauge side tanks

B. M. WEISS COMPANY
Girard Trust Company Building
Philadelphia 2, Pennsylvania

CRUSHER — ELEVATORS — SCREENS — CONVEYORS

1—RELIANCE 8" x 14" Portable Jaw Crusher
1—New 9" x 15" BEAUMONT Jaw Crusher
2—Used 9" x 15" CHAMPION Jaw Crushers
1—10" x 20" CHAMPION Jaw Crusher
1—12" x 20" BUCHANAN Jaw Crusher
3—12" x 26" CHAMPION Jaw Crushers
1—#1030 CHAMPION Roller Bearing Crusher
1—4½" TRAYLOR Gyratory Crusher
1—#2F TELSMITH Gyratory Crusher
2—NEW Small Hammer Mills

JOHNSON & HOEHLER, INC.
Lansdowne, Pa.

FOR SALE

Without Priority

COMPLETE USED BLOCK PLANT EQUIPMENT

2—Stearns Automatic Clipper Strippers
1—Stearns 18 cu. ft. Wiper
1—Barrett Cravens Lift Truck
10,000—4", 8" & 12" pressed steel plates

• •

RINKER MATERIALS CORP.
West Palm Beach, Florida

PULVERIZERS

One (1)—Sturtevant Vertical Emery Mill, new emery stones recently. Price $675.00.
Four (4)—Kent Maxecon Ring Roll Mills, in good running condition, may be seen in operation. Price each $1675.00.
One (1)—Bradley 3 Roll Pulverizer. Price $1150.00.

WHITEROCK QUARRIES
Bellefonte, Pennsylvania

CRUSHERS, ROLLS, MILLS

Acme 6"x21" type C jaw crusher, roller bearings
Acme 18"x32" type 18D jaw crusher, cast steel frame
N. E. 11"x20" jaw crusher with cast steel frame
Buchanan 10"x16" Blake type jaw crusher
Scholl 9"x16" jaw crusher, heavy cast frame
Reliance 8"x14" jaw crusher, cast steel frame
Gruendler 5"x7½" jaw crusher
Traylor "BULLDOG" 11" gyratory crusher
Robins double roll 24"x30" coal crusher
Single roll 24"x24" spiked crusher
Simplex coal pulverizer with roller bearings
Sturtevant No. 0 ROTARY FINE crusher
Williams #2 Hammermill
Mid-West #2 Hammermill
Eight tons steel balls, 1" to 2"

BUCKET ELEVATORS

Enclosed 12" bucket chain elevators, 40 to 80'
Chain elevators, 16", 18", 20" buckets
Enclosed 6"x30' chain bucket elevator
Continuous 12"x42' bucket elevator
Continuous 14"x42' chain bucket elevator
Continuous 14"x50' chain bucket elevator
Continuous 30"x35' double chain bucket elevator
New and used belt and chain for elevators
Grain elevators with 11", 14" and 18" buckets
Link-Belt chain elevator for barrels

CONVEYORS

Steel belt conveyor, 24"x96'
Jeffrey heavy duty package conveyor, 42"x150'
Jeffrey 24" Standard Steel Apron Feeder, 5' to 10'
L-B Single Strand Flight conveyor, 15"x56'
New conveyor belt reconditioned belt idlers
Belt conveyor pulleys for 12" to 36" belt
Belt trippers, for 14", 16", 18" and 24" belt
Screw conveyors, 9", 10", 12", 14", and 16" flights
Flat steel plate conveyor, 47"x25'
Haiss 14" portable belt conveyor, 24' with motor

VIBRATING AND REVOLVING SCREENS

Robins "GYREX" 4'x10' double deck vibrating
Simplicity 3'x6' three deck vibrating
Deister "PLAT-O" 3'x7' single deck vibrating
"JIGGER" 2'x5' three deck vibrating
"HUMMER" 3'x5' single deck vibrating
"HUMMER" 4'x5' single deck vibrating
Electric generators for "HUMMER" screens
Revolving screens: 42"x18', 48"x20'

MISCELLANEOUS

Sauerman 50 hp electric dragline hoist
National 25 hp electric double drum hoist
Lidgerwood 15 hp electric single drum hoist
C-P air compressor NSB, 529 CFM, belt driven
I-R air compressor on skids, 275 CFM, gasoline
G-E 100 hp slip ring motor, 3/60/220/720 rpm
Morris manganese lined 6F sand pump
Ellicott 4" belt driven sand pump
Worthington 4" centr. pump with 25 hp motor
Two 6" centr. 15 hp electric vertical pumps
Whitcomb 36" gauge 8 ton gasoline locomotive
Flat cars for 24" and 20" gauge, 30" turntables
400 hp V-belt double pulley drive with V belts
Enclosed 20 hp right angle drives with roller bearings
Blueprinting machine, Model A Shaw, Electric
900' Jeffrey 126 D1, left and right roller chain

STONE WORKING EQUIPMENT

2 Meyers stone saws, 48" and 60" dia., late type
2 Lincoln 42"x12' open side electric planers
1 Lincoln 36"x12' open side electric planer
1 Patch 36"x12' open side belt driven planer

G. A. UNVERZAGT & SONS

136 Coit St. Irvington, N. J.

COMPRESSORS

231 CFM Type ER-1 Ingersoll Rand, complete with 75 H.P. 3/60/2200 V motor
308 CFM Type ER-1 Ingersoll Rand, complete with 75 H.P. 3/60/2200 V motor
368 CFM Type NSB Chicago Pneumatic horiz., complete with 60 H.P. G.E. 3/60/440 motor
515 CFM Type XB 2 Ingersoll Rand, complete with 100 H.P. 3/60/2200 V motor
518 CFM Type XCB Ingersoll Rand, with 100 H.P. slip ring motor
526 CFM Ingersoll Rand, Style "J"
888 CFM Ingersoll Rand, Type XB horiz. compound 2-st.
940 CFM Ingersoll Rand, 10 horiz. 2-st. steam-driven, with receiver

CRUSHERS

24" x 54" Superior Crushing Rolls
No. 3 and No. 6 McCully Gyratory

LOCOMOTIVES

1—6 ton Milwaukee, 36" ga., gasoline
1—7 ton Milwaukee, 36" ga., gasoline
1—9 ton Whitcomb, 36" ga., gasoline
1—30 ton Mack, diesel-electric, std. ga.

SHOVELS — CRANES & DRAGLINES

No. 2 Koehring 3-way comb. crane, dragline & shovel
Model 77 Lorain comb. crane, dragline & shovel, 1½-yd. cap.
Model 780 P&H Dragline, 75' boom, 2-yd.
320-B Bucyrus Stripping, 6½-yd. cap.
Model 54-B Bucyrus Dragline, 70' boom with light plant, powered by Buda diesel engine
Model 80 Northwest Dragline, 70' boom, powered by Twin City oil engine

TANK & TOWER

60,000 gallon Water Tank on 89'9" tower, with 10" riser pipe.

TANKS, Storage

All capacities — Expertly rebuilt!

TRACTOR WAGONS

7, 7 cu. yd. Allis Chalmers Speed-Ace
(Write for illustrated bulletin)

IRON & STEEL PRODUCTS, INC

13490 S. Brainard Ave., Chicago 33, Illinois
"Anything containing IRON or STEEL"

LOCOMOTIVE CRANES & LOCOMOTIVES

85 Ton American Switcher
50 Ton Industrial Crane
35 Ton McMyler Crane
25 Ton Industrial Crane
25 Ton Browning Crane
22 Ton Ohio Crane
15 Ton Ohio Crane
12 Ton Gas Crane
20 Ton Electric Locomotive
18 Ton Gas Loco. S.G.
30 Ton Loco. Steam S.G.
25 Ton Loco. Steam S.G.
40 Ton Loco. Steam S.G.
50 Ton Loco. Steam S.G.
57-67 Ton Loco. Saddle Tank
60 Ton Elec. Loco. Batt. Type S.G.
40-45-50 Ton Loco. All Elec. S.G.
65 Ton Switching Loco.
70 Ton Shay Geared Loco.
120 Ton Locomotive 0-8-0
50 to 75 Ton Stiff leg Derrick

TRUCK CRANES

½ yd. Orton

SHOVELS—CRANES—CRAWLERS

2 yd. 50-B Bucyrus-Erie Crane, Steam—Diesel
2 yd. Page Model 411 Walker
1½ yd. Marion Shovel, Model 362
1¼ yd. McMyler Crawler Crane
1¼ yd. Northwest Dragline No. 104
1 yd. Byers Master Crane-Shovel
½ yd. Byers Bear Cat Model 27 Crane
⅜ yd. Insley Type C Shovel
Shovel front for Bay City 25

TRACTORS

Allis-Chalmers L with B/D
Caterpillar "50" Diesel
Caterpillar "50" Gas with angledozer

MISCELLANEOUS

Car-Twin Hopper S.G. 50 Ton
25,000 Gal. Steel Tanks
2½ yd. Hayward Rehandler Clam. Bucket
4 yd. Hayward Rehandler Clam. Bucket
2 yd. Brownhoist Coal Handler Clam. Bucket
210 H.P. Diesel Motor

R. J. Stone **Ray S. Betham**

"STONE — the CRANE MAN"

502 Insurance Exchange Bldg., Detroit 1, Michigan
PHONES: Randolph 6156-4065

a 'MAW-FULL'-every Load...

a 'MOUTHFUL' at Every Bite

Our landing craft, which have put hordes of fighting men and machines on enemy shores with incredible speed, have impressed the world with their efficiency.

Impressive too, is the efficiency with which Owen Buckets operate—taking capacity grabs of materials quickly—discharging them speedily—handling great yardage at low cost.

THE OWEN BUCKET CO.
6050 Breakwater Ave., Cleveland, O.
Branches: NEW YORK - CHICAGO - PHILADELPHIA - BERKELEY, CAL.

OWEN BUCKETS

Index to Advertisers

*Allis-Chalmers Mfg. Co.....10-11
American Air Filter Company.... 15
*American Cable Div. American Chain & Cable Co., Inc.....Inside Back Cover
*American Chain & Cable Co., Inc.....Inside Back Cover
American Manganese Steel Co....104
*American Pulverizer Co.....123
American Rubber Company.....146
American Zinc Co. of Tennessee.155
Anchor Concrete Machy. Co.....137
Atlas Powder Co.....150
*Babcock & Wilcox Co..... 64
Bacon, Inc., Earle C.....122
*Barber-Greene Co. 28-29
Barrett-Cravens Company 143
Baughman Mfg. Co., Inc.....145
*Bemis Bro. Bag Co..... 8
*Bethlehem Steel Co..... 22
Birmingham Rail & Locomotive Co. 152
*Blaw-Knox Company 146
Brill Equipment Co.....151
Broadcast Section 151-159
Broderick & Bascom Rope Co.... 58
*Brooks Equipment & Mfg. Co...118
*Buda Company, The..... 21
Burnham, Royal E.....156
Carlyle Rubber Co., Inc.....157
Carter Company, Ralph B.....148
Carver Pump Company.....111
Chase Foundry & Mfg. Co.....142
Chicago Perforating Co.....122
*Chicago Steel Foundry Co.....116
Cleveland Wire Cloth & Mfg. Co..148
Climax Engineering Company.....110
*Colorado Iron Works Co.....125
*Columbus Conveyor Co.....147
Concrete Transport Mixer Co.....143
Conserco, Incorporated 141
Consolidated Products Co., Inc...153
*Cummins Engine Company..... 30
Davenport Locomotive Works.....113
Dempster Bros., Inc..... 59
*Denver Equipment Co.....150
DeSoto Foundry Co., Inc.....126
*Diamond Iron Works, Inc.....150
*Dixie Machinery Mfg. Co.....112
*Dorr Company 127
Dundee Engineering Company....156
du Pont, E. I., de Nemours..... 42
*Eagle Crusher Company, Inc.....148
*Eagle Iron Works.....114
Easton Car & Construction Co... 1
*Ensign-Bickford Co., The..... 53
Equipment Corporation of America 152, 155
*Erie Steel Construction Company.136
*Euclid Road Machy. Co..... 55
Flexible Steel Lacing Co.....146
Flink Company 146
Frog, Switch & Mfg. Co.....119
*Fuller Co. 27
Gardner-Denver Company 32
Gates Rubber Co..... 6
General Excavator Company..... 56
Goodyear Tire & Rubber Co., The 9
*Gruendler Crusher & Pulverizer Co. 147
Gulf Oil Corp..... 5
Haiss Mfg. Co., Inc., Geo.....159
*Hardinge Company 108
Heat and Power Company.....159
Heidenreich, Jr., E. Lee.....156
*Hendrick Mfg. Co.....149
Hendy Iron Works, Joshua..... 40
Hercules Powder Co..... 33
Hercules Steel Products Co.....109
Hills-McCanna Company 145
Independent Pneumatic Tool Co.. 14
Industrial Brownhoist Co.....107
Inland Equipment Company.....152
*Iowa Manufacturing Co..... 41
Iowa Portable Mill Company.....152
Iron & Steel Products.....154, 159
*Jackson & Church Co.....129
*Jaeger Machine Co.....141, 143
*Jeffrey Mfg. Co..... 58
Kansas City Hay Press Co.....149
*Kennedy-Van Saun Mfg. & Engr. Corp. 38
Kent Machine Co.....138
Koehring Company 18-19
Kremser & Sons, Inc., Frank A..155
*Laughlin Co., Thomas.....106
*LeTourneau, Inc., R. G..... 31
Lima Locomotive Works, Inc.....127
*Link-Belt Co. 147
Lovejoy Flexible Couplings Co...126
Ludlow-Saylor Wire Co..... .....Inside Front Cover
*Machin Company, The E. C.....120
Mack Manufacturing Co..... 51
*Macmillan Petroleum Corporation 23
Manhatten Rubber Mfg. Div.....150
*McLanahan & Stone Corp.....145
*Merrick Scale Co.....122
Mine & Smelter Supply Co..... 37
Morris Machine Works.....105
Mott Core Drilling Company.....149
*Multiplex Concrete Machy. Co....141
National Supply Co..... 57
*National Wire Cloth Co., Inc....150
Naylor Pipe Co.....115
Neff & Fry Company.....141
Neill Company, W. B.....128
New Holland Machine Co.....121
Nicholson Company, J. A.....158
*Nordberg Mfg. Co..... 48
Northwest Engineering 39
O'Neill, A. J.....153
Osgood Company, The..... 56
Ottawa Steel Products, Inc.....153
*Owen Bucket Co.....160
Pacific Machinery Company.....151
Patterson Equipment Co.....151
Pennsylvania Drilling Co.....156
*Pioneer Engineering Works..... 44
Porter Company, H. K.....107
*Quaker Rubber Corp..... 16
Quimby Pump Company, Inc., Division of H. K. Porter Company, Inc. 107
*Raymond Pulverizer Div. of Combustion Engineering Co., Inc.. 46
St. Regis Paper Company..... 43
*Sauerman Bros., Inc.....138
Schaffer Poidometer Co.....121
Schramm, Incorporated 63
*Screen Equipment Co., Inc.....116
Sheppard Company, The R. H.... 52
Simplicity System Company, The.149
Sinclair Refining Company (Inc.).103
*Sly Mfg. Co., The W. W.....101
*Smidth & Co., F. L..... 20
Smith Engineering Works..... 24
Southern Aggregate Corporation..157
Southern Iron & Equipment Co..154
Sprout, Waldron & Co., Inc.....150
Stanhope, Inc., R. C.....152
*Stearns Mfg. Co.....144
Stephens Adamson Mfg. Co..... 45
"Stone," the Crane Man.....159
*Sturtevant Mill Co..... 12
Syntron Co. 137
Taylor Forge & Pipe Works..... 54
Texas Company, The..... 61
Thermoid Rubber, Division of Thermoid Company 35
Thew Shovel Co..... 3
Thornton Tandem Company.....140
Trackson Company 49
*Traylor Engineering & Mfg. Co.. 7
Trojan Powder Company..... 47
*Twin City Iron & Wire Co.....149
*Tyler Co., The W. S.....150
United Pipe & Supply Co.....153
United States Rubber Company.. 25
United States Treasury Department 124
Universal Concrete Pipe Company.143
*Universal Engineering Corp..... 34
Universal Road Machy. Co.....149
*Universal Vibrating Screen Co....149
Unverzagt & Sons, G. A.....159
Upson-Walton Company, The..... 2
Utica Hydraulic Cement Company.154
Van der Horst Corporation of America 13
Walsh Co., Richard P.....151
Walsh Company, W. T.....154
Webber Equipment Co.....158
Wellman Company, The S. K.... 4
*Wellman Engineering Co.....128
*Western Precipitation Corp.....117
Whayne Supply Co., Roy C.....155
Wickwire Spencer Steel Company. 36
*Williams Pat. Crusher & Pulverizer Company 148
Wisconsin Motor Corp.....147
Wood's Sons Company, T. B..... 26
*Worthington Pump and Machinery Corp.....160, Outside Back Cover
Worthington Pump & Machy. Corp., Standard Products Div.. 17
Yates Machine Works..... 158

***See also Detailed Information in 1944 Pit and Quarry HANDBOOK**

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools.

See full page ad on outside back cover.

ALABAMA
Birmingham—Tractor & Equipment Co.

ARIZONA
Phoenix—Smith Booth Usher Company

ARKANSAS—Fort Smith—R. A. Young & Son
Little Rock—R. A. Young & Son

CALIFORNIA
Los Angeles—Smith Booth Usher Company
San Francisco—Edward F. Hale Company

CONNECTICUT
Hartford—The Holmes-Talcott Company

GEORGIA
Atlanta—Tractor & Machinery Co., Inc.

ILLINOIS—Chicago—Kennedy-Cochran Co.

INDIANA
Indianapolis—Reid-Holcomb Company

IOWA—Des Moines—Electrical Eng. & Constr. Co.
Davenport—Industrial Engineering Equipment Co.

KENTUCKY—Harlan—Hall Equipment Sales
Louisville—Williams Tractor Company

LOUISIANA
New Orleans—Wm. F. Surgi Equipment Company

MAINE—Augusta—Murray Machinery Co.

MARYLAND
Baltimore—D. C. Elphinstone, Inc.

MASSACHUSETTS
Cambridge—W. W. Field & Son, Inc.
Springfield—The Holmes-Talcott Company

MICHIGAN
Detroit—W. H. Anderson Company, Inc.
Muskegon—Lakeshore Machinery & Supply Co.

MISSOURI
Kansas City—Machinery & Supplies Company

MONTANA—Helena—Caird Engineering Works

NEW JERSEY
Hillside—P. A. Drobach
North Bergen—American Air Compressor Corp.

NEW MEXICO
Roswell—Smith Machinery Company

NEW YORK
Albany—Larkin Equipment Company
Albany—T. Southworth Tractor & Machy. Co., Inc., Menands
Binghamton—MacDougall Equipment Co.
Buffalo—Dow & Company, Inc.
New York—Hubbard & Floyd, Inc.
Olean—Freeborn Equipment Company
Oneonta—L. P. Butts, Inc.
Syracuse—Harrod Equipment Company

OHIO—Cincinnati—The Finn Equipment Company
Cleveland—Gibson-Stewart Company
Marietta—Northwest Supply & Equipment Co.
Toledo—M. W. Kilcorse & Company

OKLAHOMA
Oklahoma City—Townsco Equipment Co.

OREGON
Portland—Andrews Equipment Co.

PENNSYLVANIA
Easton—Sears & Bowers
Harrisburg—N. A. Coulter
Oil City—Freeborn Equipment Company
Philadelphia—Metalweld, Inc.
Pittsburgh—John McC. Latimer Company
Wilkes-Barre—Ensminger & Company

SOUTH CAROLINA
Columbia—Bell-Lott Road Machinery Co.

SOUTH DAKOTA
Sioux Falls—Empire Equipment Co.

TENNESSEE
Chattanooga—James Supply Company
Knoxville—Wilson-Weesner-Wilkinson Co.
Memphis—Tri-State Equipment Company

TEXAS—Dallas—Shaw Equipment Company
El Paso—Equipment Supply Company
Houston—Dye Welding Supply Co.
San Antonio—Patten Machinery Company

VIRGINIA
Richmond—Highway Machinery & Supply Co.

WASHINGTON
Seattle—Star Machinery Company
Spokane—Andrews Equipment Service

WEST VIRGINIA
Fairmont—Interstate Engineers & Constructors

WYOMING
Cheyenne—Wilson Equipment & Supply Co.

★ ★ ★

Get more WORTH from air with WORTHINGTON

Buy Blue Brutes

Worthington Pump and Machinery Corp.